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Watershed Data Base: North Thompson River

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ABSTRACT

Brown, T. G., S. Sihikalo, L. Walthers, B. A. York and I. V. Williams. 1989. Watershed data base: North Thompson River. Can. Data Rep. Fish. Aquat. Sci. 773: 105 p.

Catalogue of 46 drainages entering the North Thompson River. Information provided includes: location, physical characteristics, forest cover, tenure status, biogeoclimatic variants and relative abundance of salmonid species. This catalogue was designed to provide a single source of the information considered essential to initiate practical study designs for future fish/forestry research.

RÉSUMÉ

Brown, T. G., S. Sihikalo, L. Walthers, B. A. York and I. V. Williams. 1989. Watershed data base: North Thompson River. Can. Data Rep. Fish. Aquat. Sci. 773: 105 p.

Catalogue des 46 réseaux de drainage qui pénètrent dans la rivière North Thompson. Parmi les informations fournies, mentionnons les suivantes: emplacement, caractéristiques physiques, couvert forestier, tenure, variables biogéoclimatiques et abondance relative des espèces de salmonidés. Ce cataloque a été compilé pour servir de source unique pour les données considérées comme essentielles à la conception des études pour les futures recherches sur les poissons et les foréts.

INTRODUCTION

British Columbia's interior watersheds support both fish and forest based resource values. Forest activities such as road construction, timber removal, and silvicultural practices have the potential of impacting salmonid production. It is essential that basic forestry related information be made available on a watershed by watershed basis. This report integrates an individual watershed's physical characteristics with its logging history and salmonid escapements. Information on forty-six watersheds located within the North Thompson River drainage system was collected (Figure 1).

A data base formatted in this manner provides a single source of information which aids habitat research and management, specifically fish/forestry research. Sound, practical study designs can be formulated and stream study pairs or watersheds having a variety of harvesting dates can be identified quickly. The watersheds listed within this report can be subjectively grouped based on their similar features. Management decisions can be based on those features of a watershed which have been deemed to cause a known response in another similar featured watershed. Groups of watersheds that may be subjected to similar forestry practices in the near future (e.g. harvesting of second growth timber) can be identified and decisions can be made on a group of watersheds rather than on single watersheds. This report may be useful in establishing rate-of-cut for a specific watershed, but care must be taken to include cuts made after 1984.

Mahood River drainage and Upper Clearwater River were not included in this report, because both have extremely large watersheds and limited accessible length for anadromous fish. Only 100-200 meters of the Mahood River is accessible, however it is heavily used by chinook and coho. Chinook and coho have been observed in the Clearwater River above the confluence of the Mahood River however it is difficult to obtain accurate counts. Salmonid escapements for salmon using the main channel of the North Thompson River were also excluded from this report.

Fishery values were expressed in terms of number of returning adults (escapement). Escapement values for coho salmon and steelhead trout, from many of the watersheds, were difficult to obtain. Values given must be considered speculative. Sockeye numbers are highly variable, dominate year values were used in this report. Resource managers must consider juvenile rearing habit located at the mouths of many of the inaccessible tributaries to be of considerable value to the fisheries in spite of the lack of spawners within that watershed.

This report was designed to be a general over-view of the area examined. Information contained within this report varies in its accuracy depending on its sources. Specific variables have been measured to varying degrees of precision from watershed to watershed. A considerable number of the watersheds examined have unknown fish values. It is hoped that as information becomes available, it can be added to this report.

INFORMATION SOURCES

Information and data contained within this report were obtained from the following sources:

1. General information on stream location, orientation and physical characteristics were obtained from topographical maps supplied by Surveys and Resource Mapping Branch, Ministry of Environment and Parks, Parliament Buildings, Victoria. A scale of 1:50,000 was used in most cases.
2. Forest cover information, including: date and area of cut or re-establishment of stands, tenure status, and length of roads were obtained from forest cover maps supplied by B. C. Forest Service (scale 1:20 000) and by Clearwater Timber Products (scale 1:10 000). All estimates of area were obtained with a polar compensating planimeter.

3. A map entitled "Biogeoclimatic Zones of British Columbia 1988" supplied by the Province of British Columbia, Ministry of Forests was used to establish the primary and secondary biogeoclimatic zones of each watershed.

4. Salmonid escapements were estimated from existing fisheries escapement records, from publications containing escapement values (Brown et al. 1979), and through consultation with fisheries officers such as F. Voysey in Clearwater.

STANDARDS USED

LOCATION AND ACCESS INFORMATION

Each watershed's location, study accessibility, map reference numbers and tenure status is recorded in Table 1. The column labels correspond to:

1. NO — Number given to each watershed, based on alphabetical order of stream name.
2. NAME — Name as given by Brown et al. 1979.
3. RIVER — If a named watershed is a tributary of another river, then that river is given under this heading.
4. LAT — The latitude of the most downstream section of a watershed.
5. LONG — The longitude of the most downstream section of a watershed.
6. CODE — The numbers 0 to 4 indicate the relative ability of persons to enter and travel within a watershed. These numbers correspond to:

VALUE	DESCRIPTION
0	No roads entering watershed and no roads within watershed. Access is by boat or hiking only.
1	No roads entering watershed. Only a small portion of the watershed is serviced by an isolated road within the watershed.
2	No roads entering watershed, however, most of the watershed is serviced by isolated roads within the watershed.
3	Good access to one location within the watershed by road, but only a small portion of the watershed is accessible.
4	Good access to the watershed and good access throughout the entire watershed by road.

7. TOPO — The serial number of main topographic map on which the named creek or river can be located.

8. COVER — The serial number of the main forest cover map on which the named creek or river can be located.

9. TFL — The percentage of the area within a watershed which is considered to be Tree Farm Licence. Within the North Thompson Drainage all land designated as T.F.L. will be located within T.F.L. 18 administered by Clearwater Timber Products.

10. DEED — This designation includes all privately owned land including mineral leases, and lands considered parks. The status of forest cover and cutting histories are unknown.

11. INDIAN — This designation includes the percentage of a watershed which is Indian Reserve. If an Indian Reserve is located within a watershed and is less than 1% of that watersheds total area, it is still designated as 1%. The status of forest cover and cutting histories are unknown.

12. TSA — This designation includes all forest land other than those considered to be Tree Farm Licences. Timber Supply Areas, are administered by the B. C. Forest Service.

PHYSICAL VARIABLES

The physical characteristics of each of the watersheds are outlined in Table 2. The column labels correspond to:

1. NO — As indicated.
2. NAME — As indicated.
3. ORIENTATION — General compass direction from upper elevation to lower elevation. Thus, a stream which has its headwaters in the north and estuary in the south would be described as "N-S".
4. PRIMARY — A biogeoclimatic zone portrays the relationship between ecosystems and climate. Watersheds with similar biogeoclimatic zones will have a similar climate and a similar vegetative association at climax.

ZONES	SYMBOL
Interior Douglas Fir	IDF
Interior Cedar - Hemlock	ICH
Engelmann Spruce -Subalpine Fir	ESSF
Montane Spruce	MS
Sub-Boreal Spruce	SBS

5. SECONDARY A biogeoclimatic zone which covers a smaller percentage of the watershed then does the primary biogeoclimatic zone.
6. DRAINAGE Watershed area including lakes, given in km^2.
7. LAKE AREA Area of all lakes in km^2.
8. TOTAL Total length of a stream or river, in km, estimated from forest cover maps.
9. ACCESS Length of stream or river, in km, that is accessible to anadromous fish.
10. GRAD Gradient of stream within accessible length was calculated from topographic maps.
11. MAX The highest point within a watershed in meters.
12. ORDER The stream order of the watershed.
13. TRIBS The number of tributaries within the accessible length. Use of tributary by salmonids may be unknown.

FORESTRY AND FISHERIES INFORMATION

The location of all 46 watersheds is indicated in Figure 1. Forestry and fisheries resource information is illustrated for each watershed (Appendix I). A description of each of the charts and graphs is given below.

1. CUT HISTORY (Bar Graph)

   Year of harvest or year of re-establishment of forest cover is indicated as both number of hectares cut and by percentage of the entire watershed affected.

2. PERCENT OF WATERSHED (Pie Chart)

   The percentages of the watershed which should be represented by a specific successional stage were calculated from forest cover maps. These are as follows:

AGE	STAGE
0 - 5	Recent Clear-cut
6 - 15	Early Successional
16 - 30	Young Immature Poles
31 - 50	Pre-Commercial Poles
51 +	Second Growth
Uncut	Old Growth

3. FISH SPECIES (Bar Graph)

The escapement values for each of the five Pacific Salmon species and Steelhead trout are indicated. The population size index, refers to:

INDEX VALUE	DESCRIPTION
0	No fish observed
1	Present some years only
2	1 - 100
3	100 - 1,000
4	1,000 - 10,000
5	+ 10,000

REFERENCES

Brown, R.F., M.M. Musgrave, and D.E. Marshall. 1979. Catalogue of Salmon Streams and Spawning Escapements for Kamloops Sub-District. Fisheries and Marine Service Data Report No. 151. 226pp.

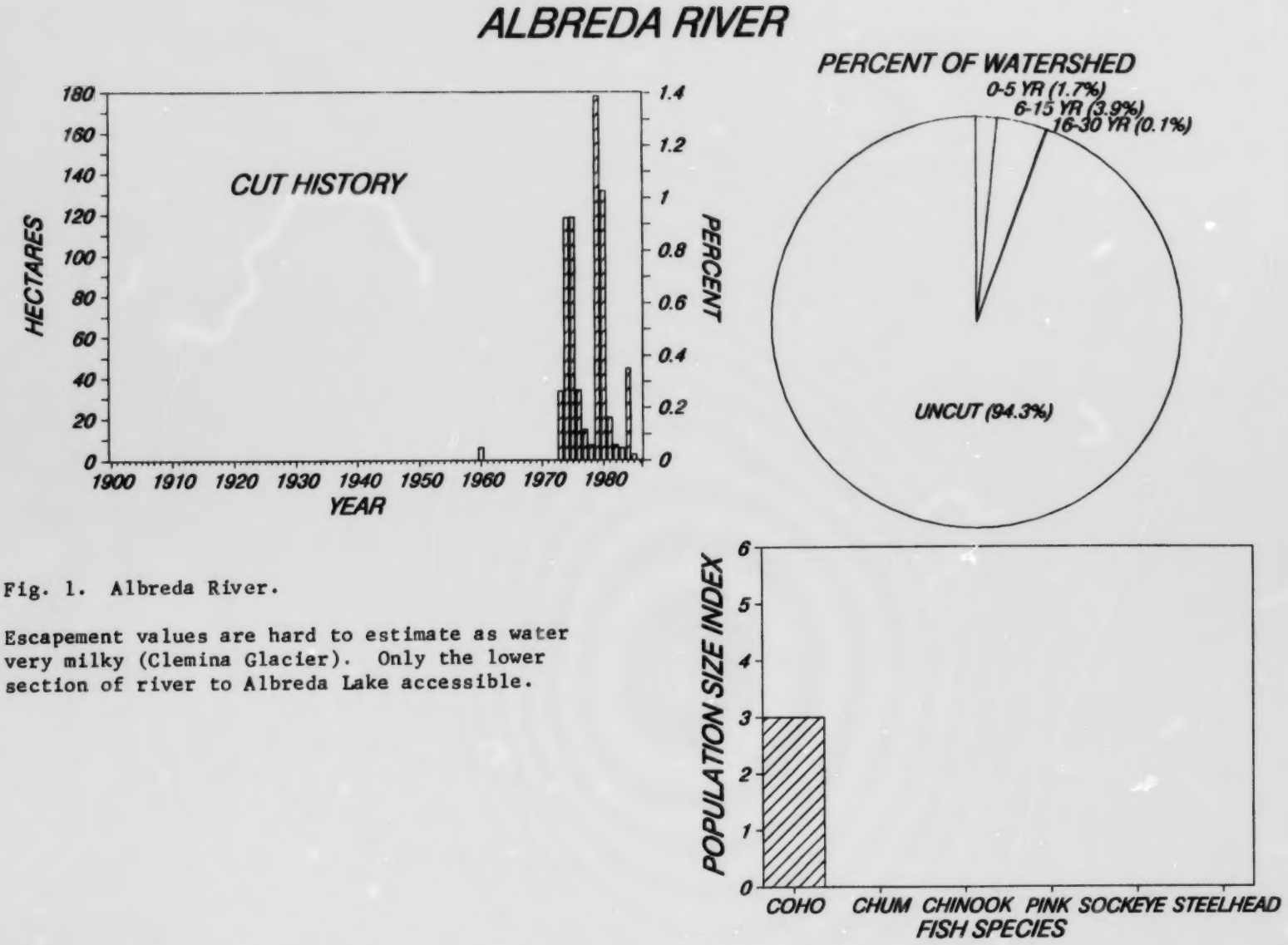


Fig. 1. Albreda River.

Escapement values are hard to estimate as water very milky (Clemina Glacier). Only the lower section of river to Albreda Lake accessible.

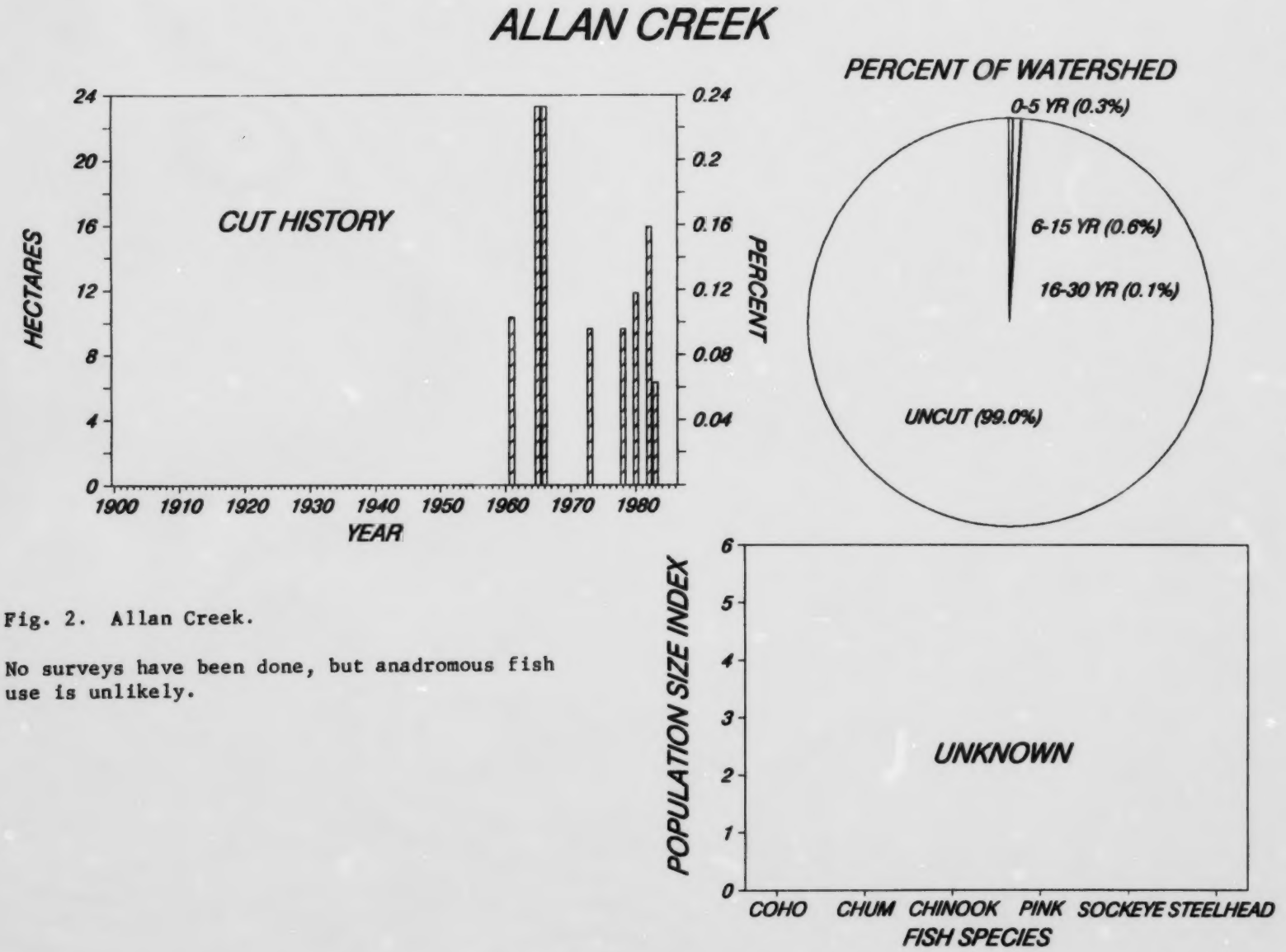


Fig. 2. Allan Creek.

No surveys have been done, but anadromous fish use is unlikely.

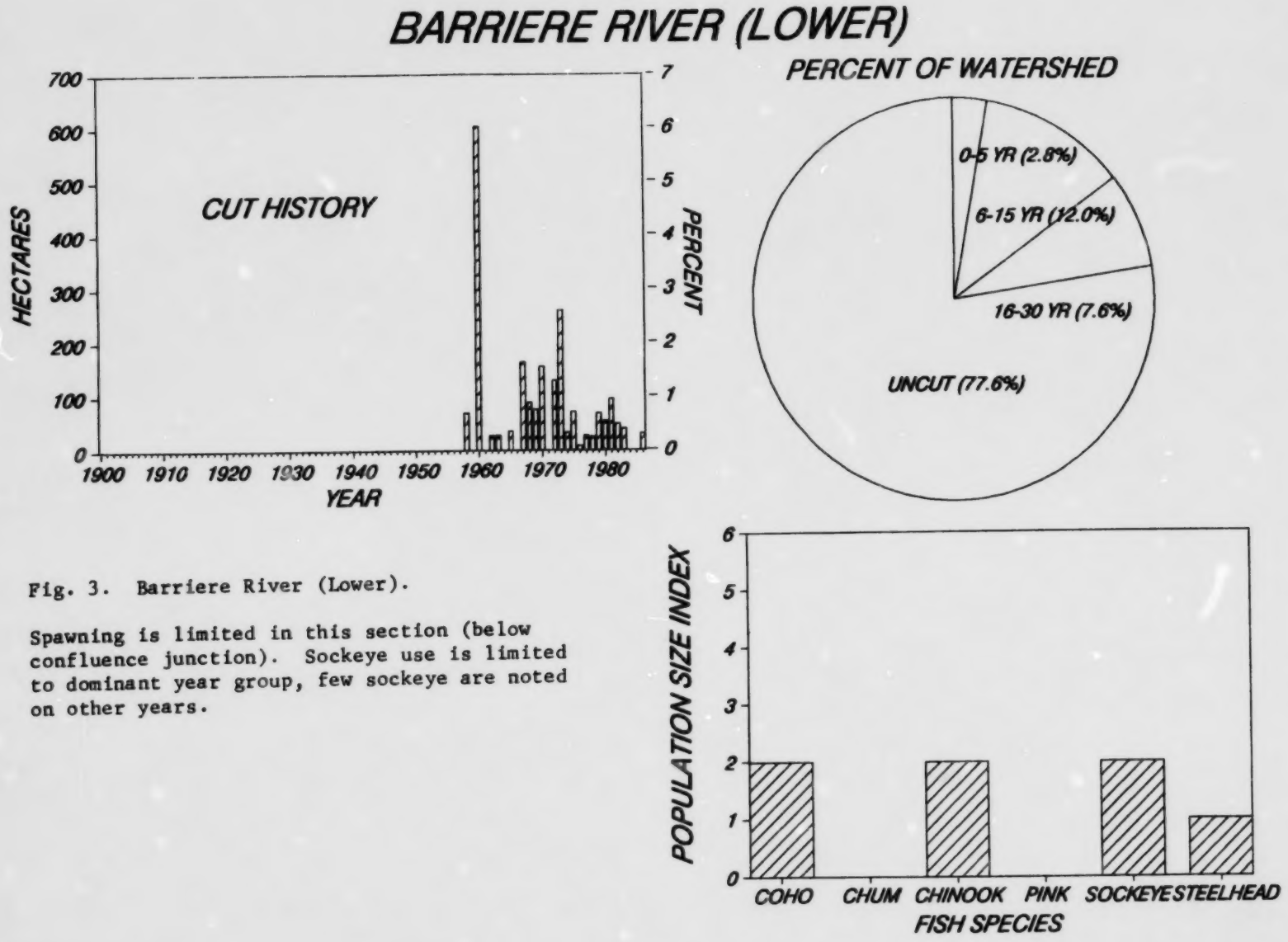


Fig. 3. Barriere River (Lower).

Spawning is limited in this section (below confluence junction). Sockeye use is limited to dominant year group, few sockeye are noted on other years.

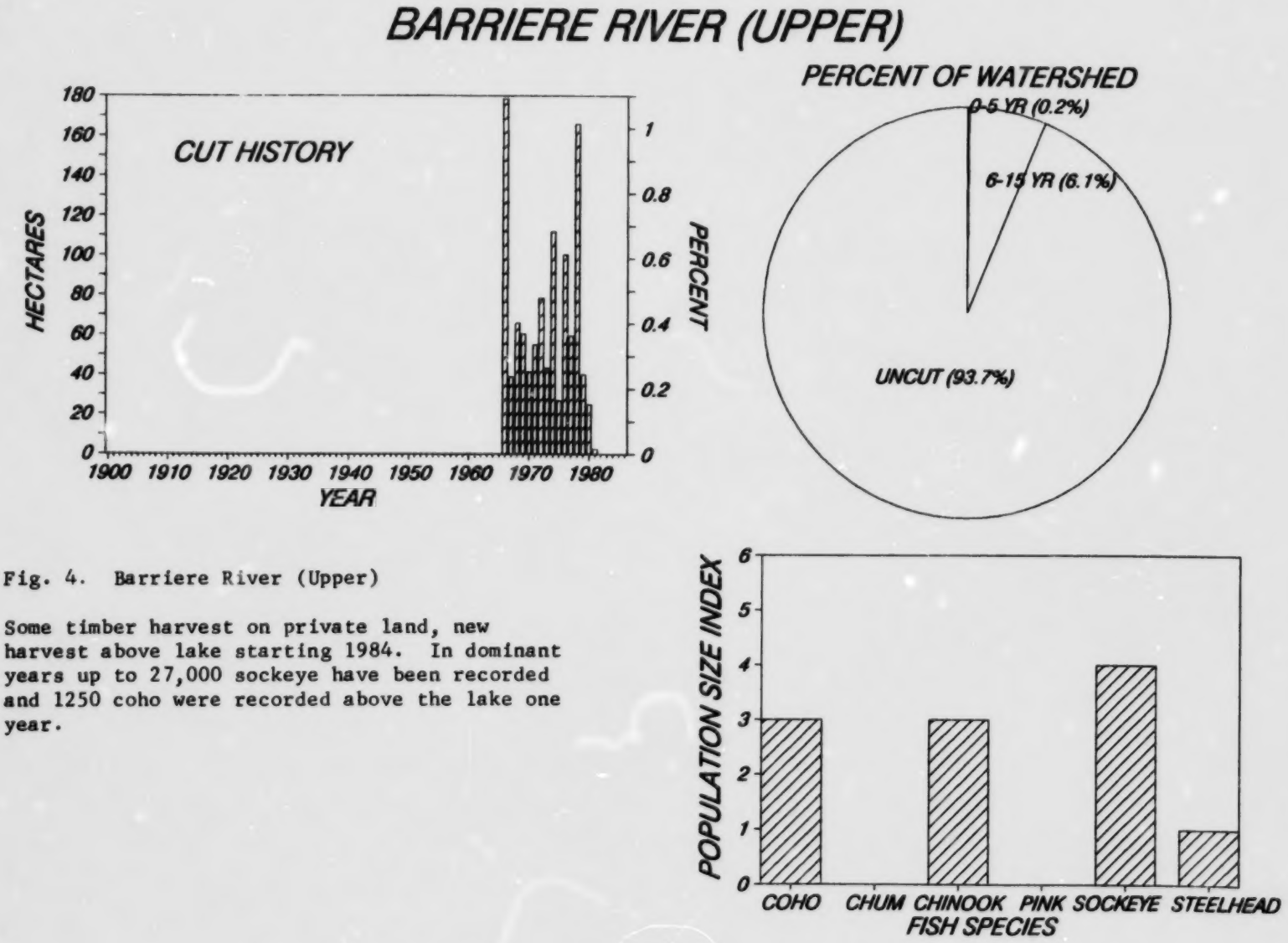


Fig. 4. Barriere River (Upper)

Some timber harvest on private land, new harvest above lake starting 1984. In dominant years up to 27,000 sockeye have been recorded and 1250 coho were recorded above the lake one year.

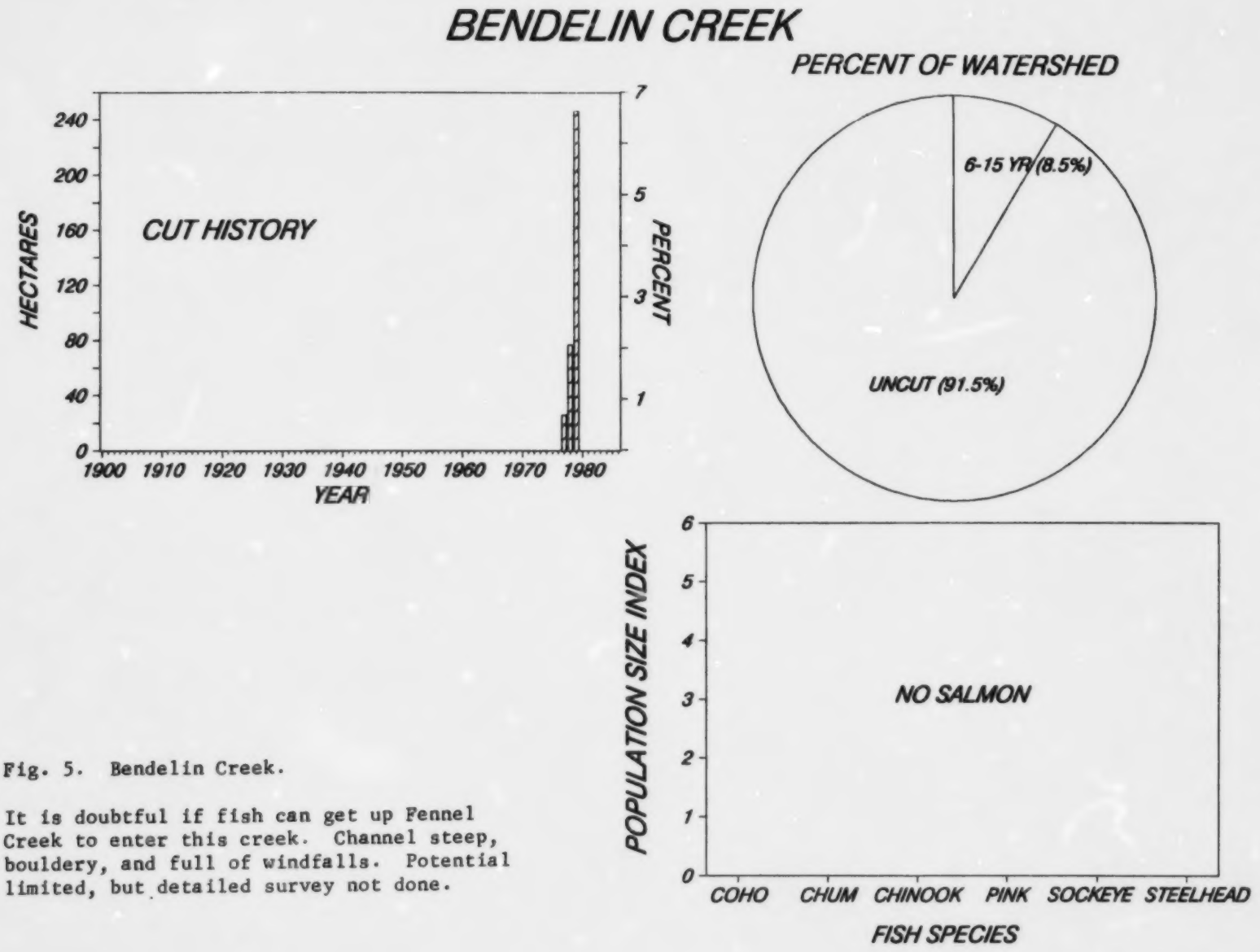


Fig. 5. Bendelin Creek.

It is doubtful if fish can get up Fennel Creek to enter this creek. Channel steep, bouldery, and full of windfalls. Potential limited, but detailed survey not done.

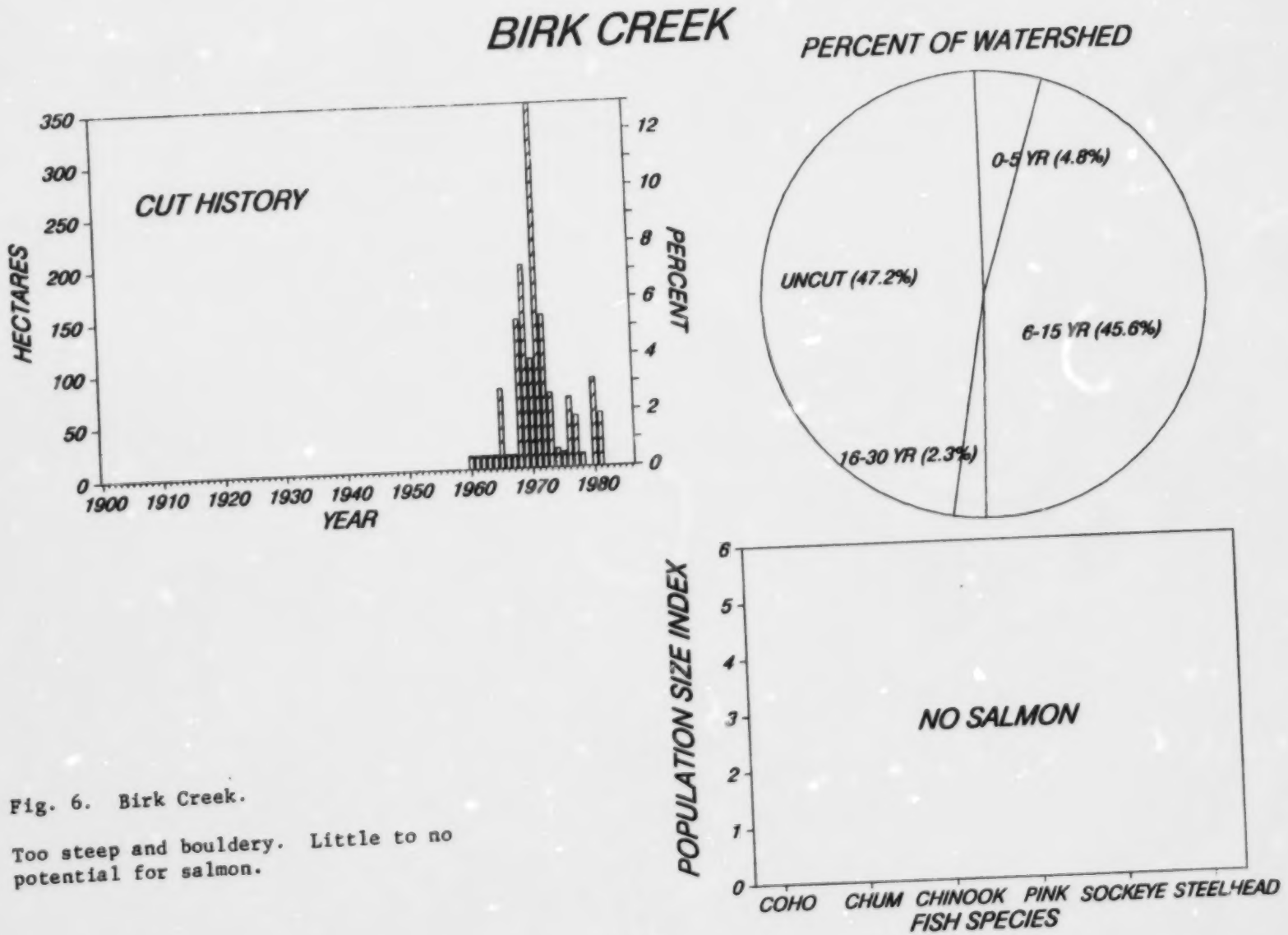


Fig. 6. Birk Creek.

Too steep and bouldery. Little to no potential for salmon.

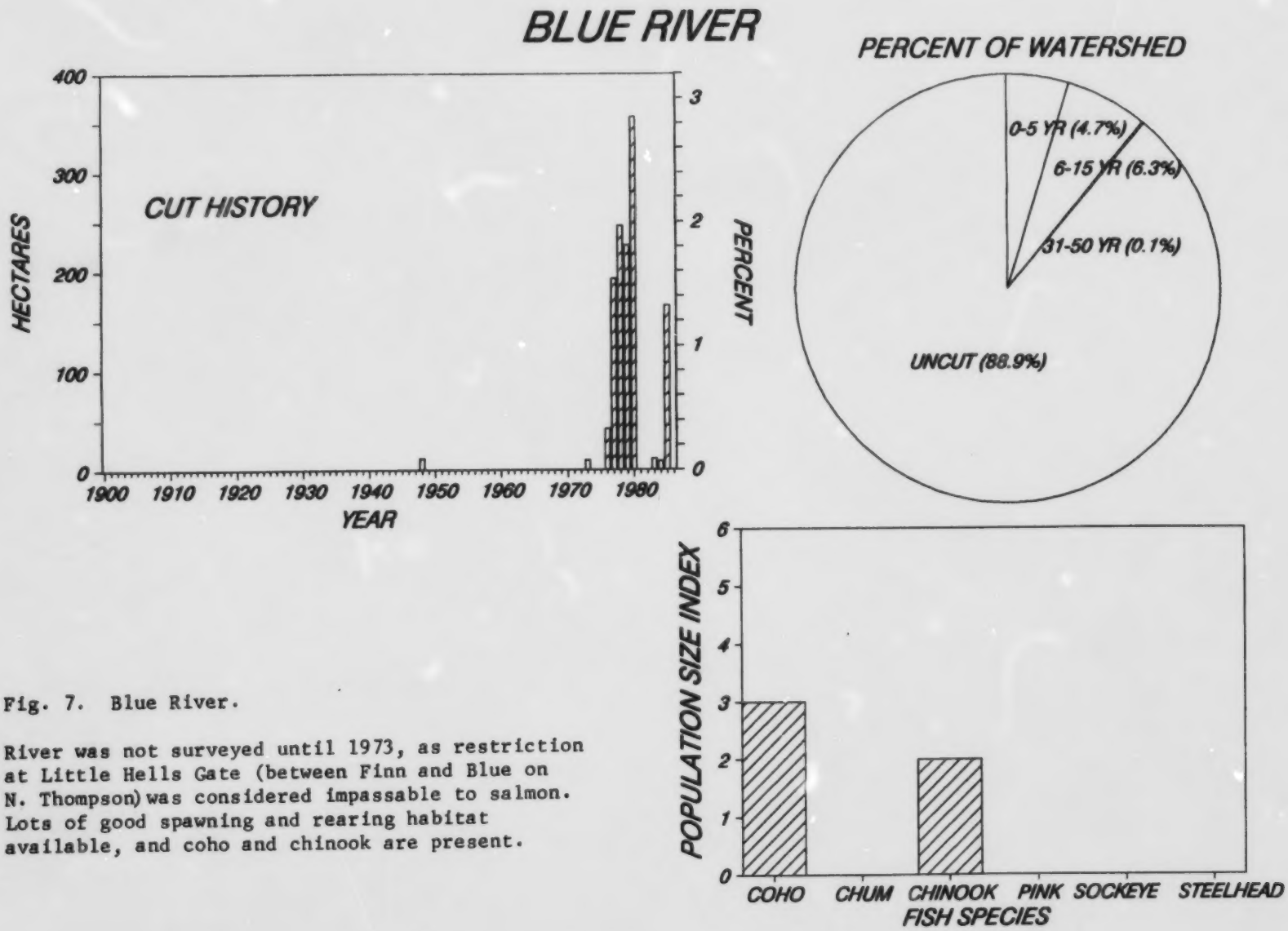


Fig. 7. Blue River.

River was not surveyed until 1973, as restriction at Little Hells Gate (between Finn and Blue on N. Thompson) was considered impassable to salmon. Lots of good spawning and rearing habitat available, and coho and chinook are present.

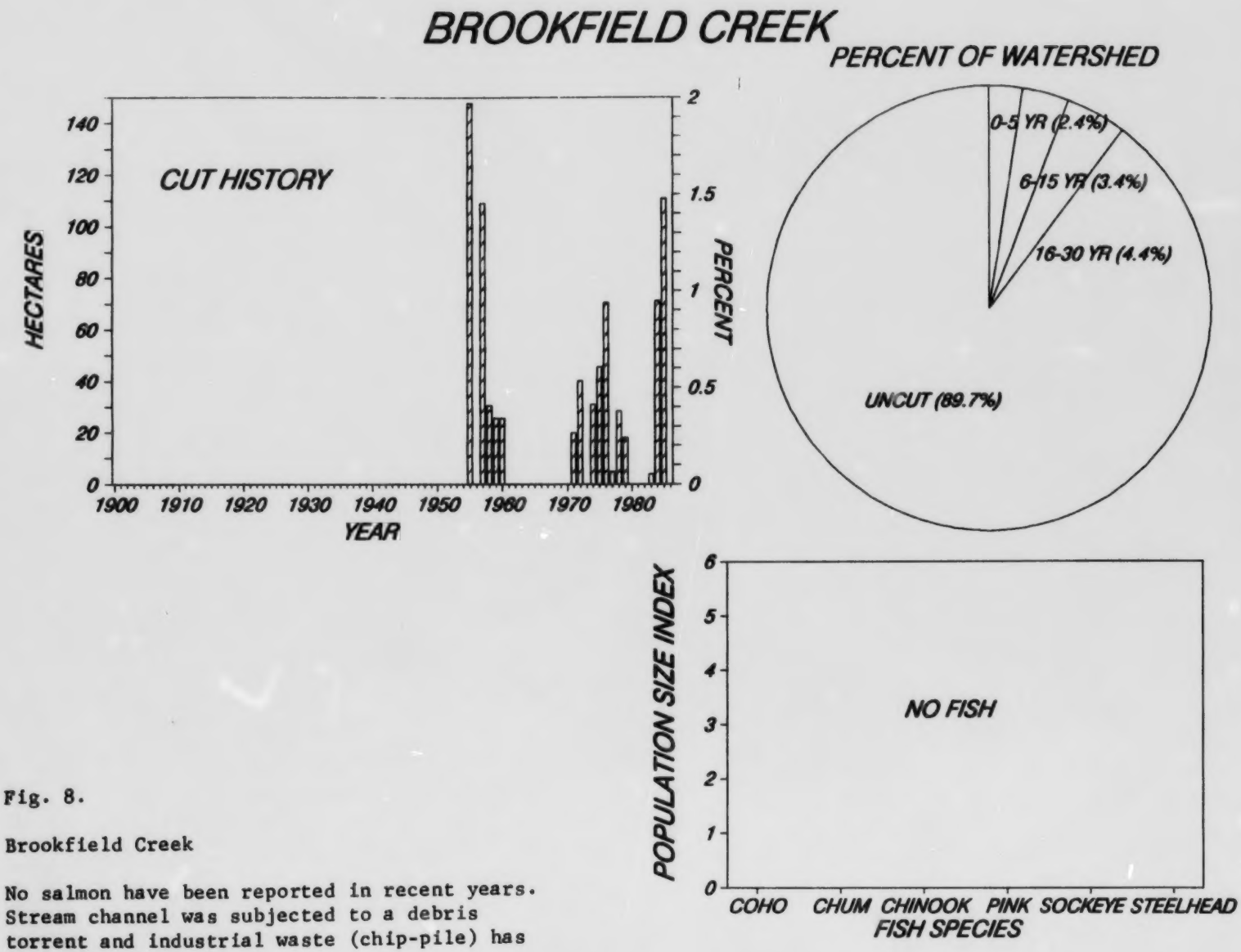


Fig. 8.

Brookfield Creek

No salmon have been reported in recent years. Stream channel was subjected to a debris torrent and industrial waste (chip-pile) has reduced habitat value.

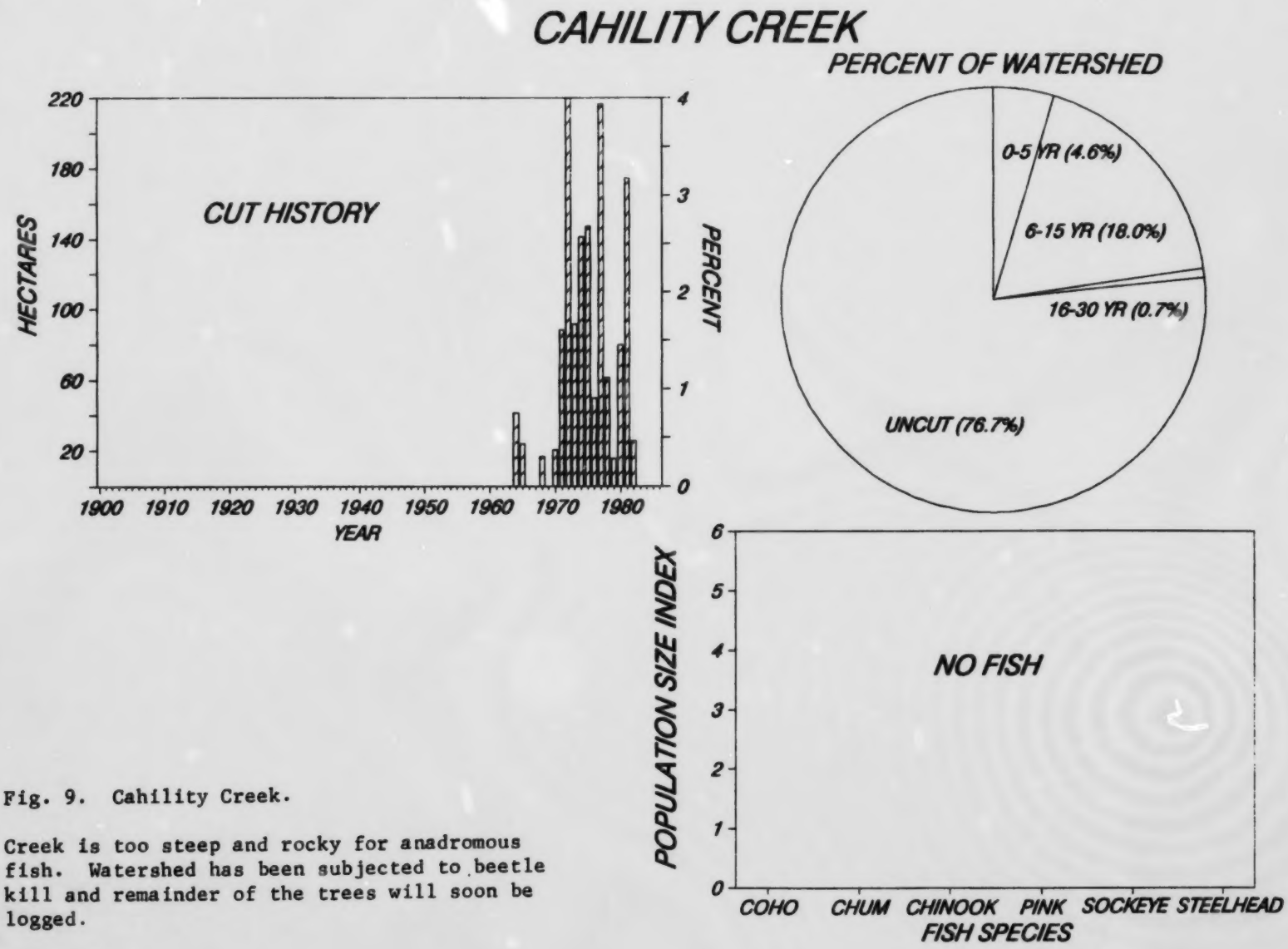


Fig. 9. Cahility Creek.

Creek is too steep and rocky for anadromous fish. Watershed has been subjected to beetle kill and remainder of the trees will soon be logged.

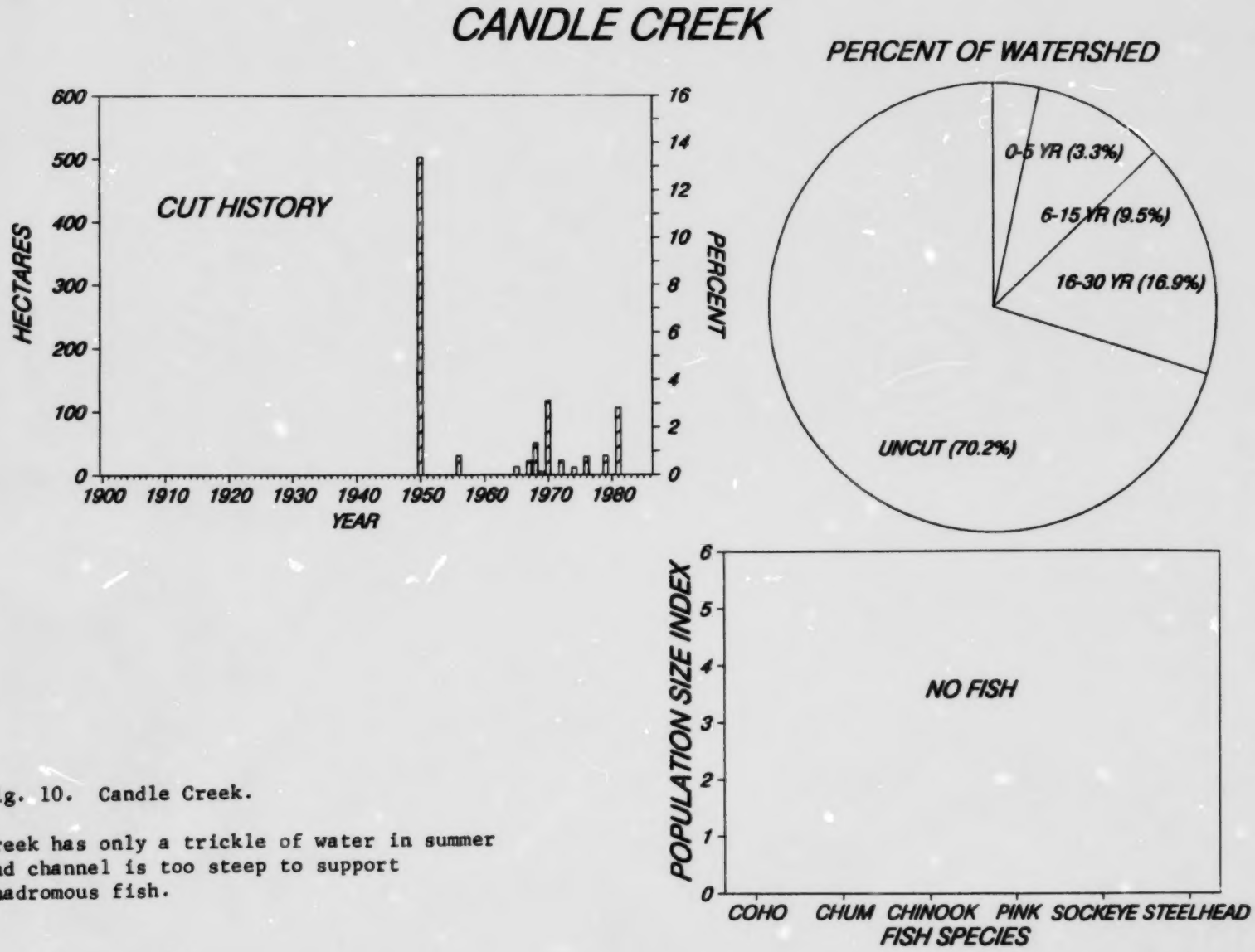


Fig. 10. Candle Creek.

Creek has only a trickle of water in summer and channel is too steep to support anadromous fish.

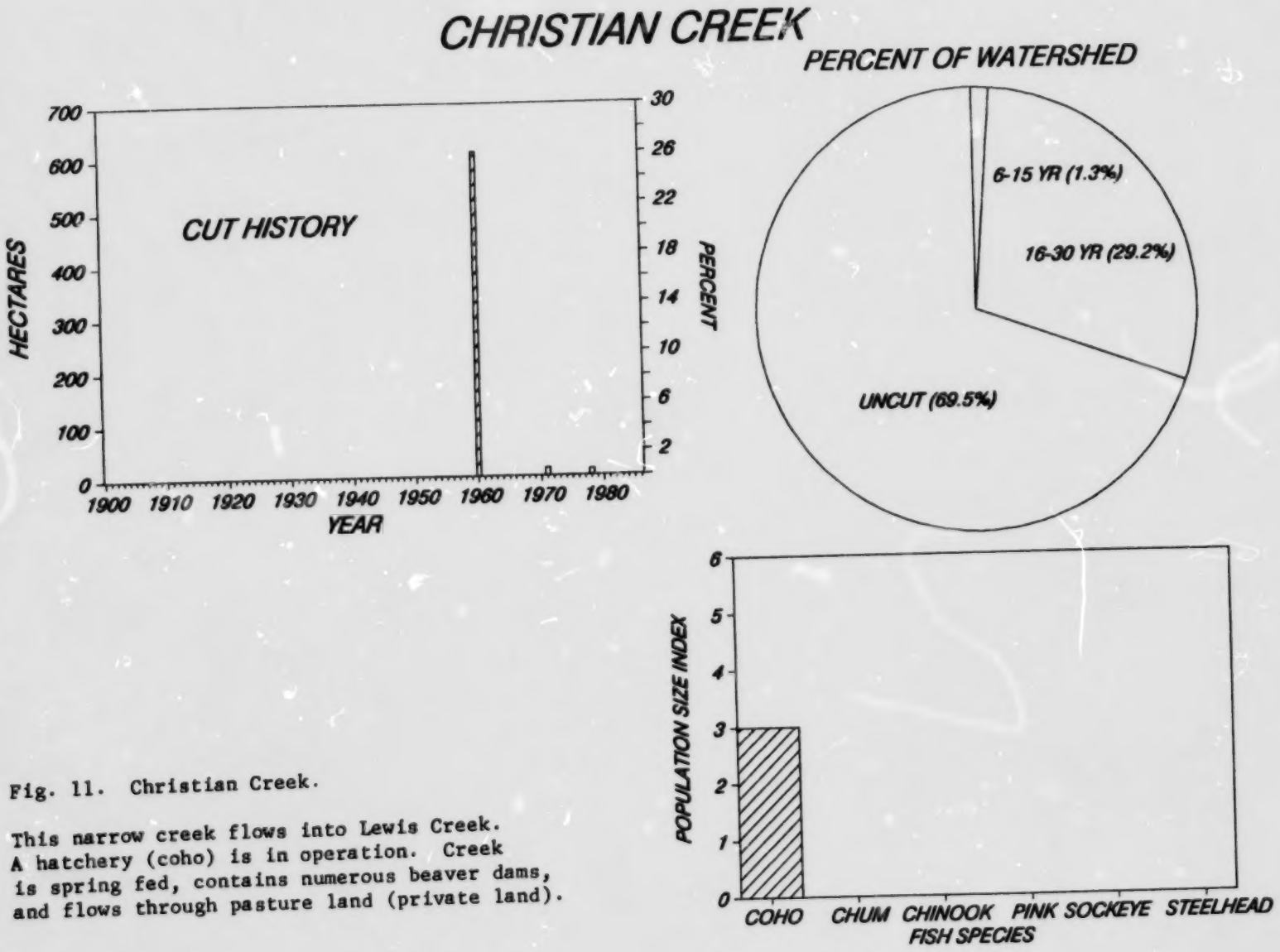


Fig. 11. Christian Creek.

This narrow creek flows into Lewis Creek. A hatchery (coho) is in operation. Creek is spring fed, contains numerous beaver dams, and flows through pasture land (private land).

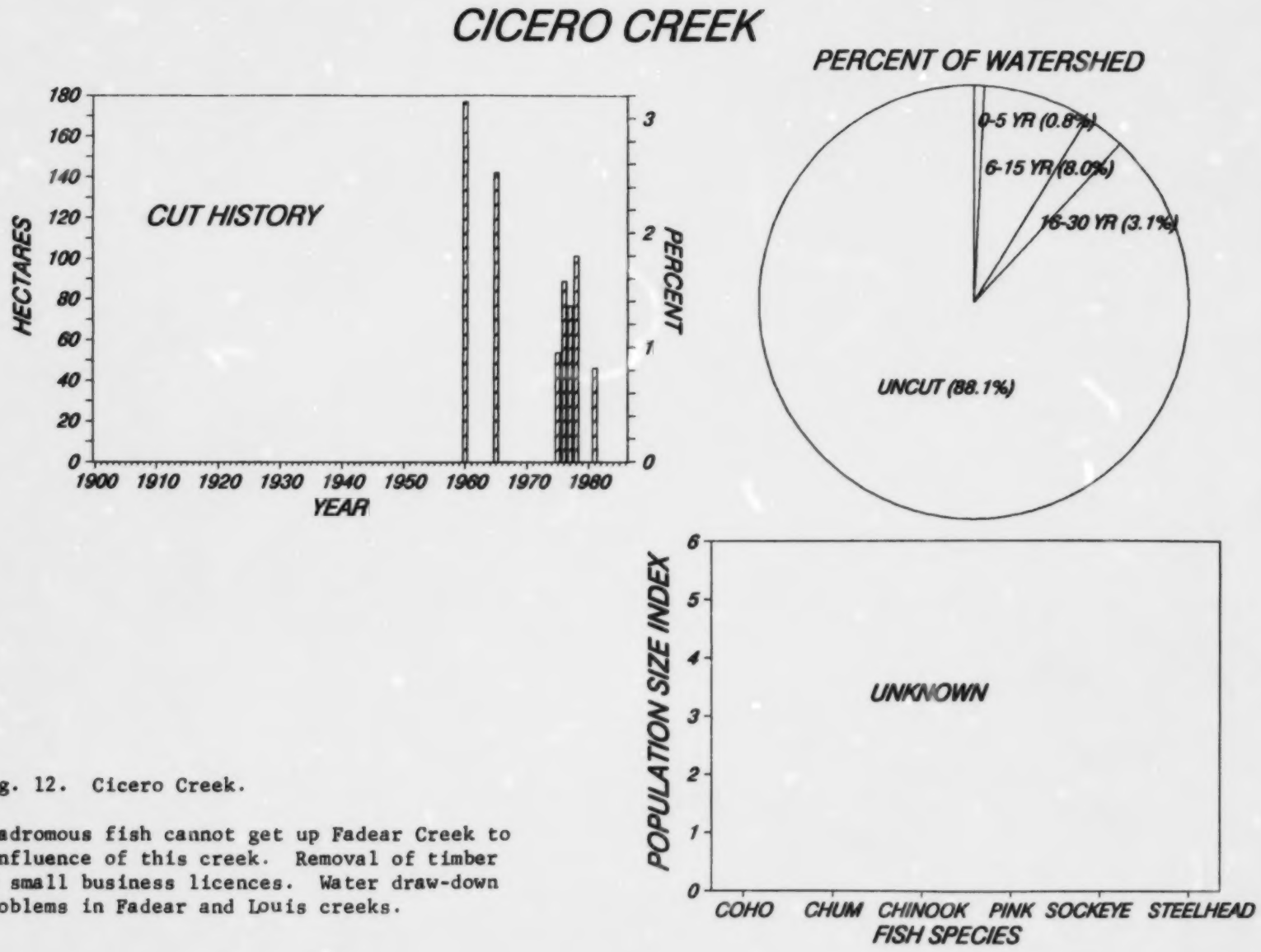


Fig. 12. Cicero Creek.

Anadromous fish cannot get up Fadear Creek to confluence of this creek. Removal of timber by small business licences. Water draw-down problems in Fadear and Louis creeks.

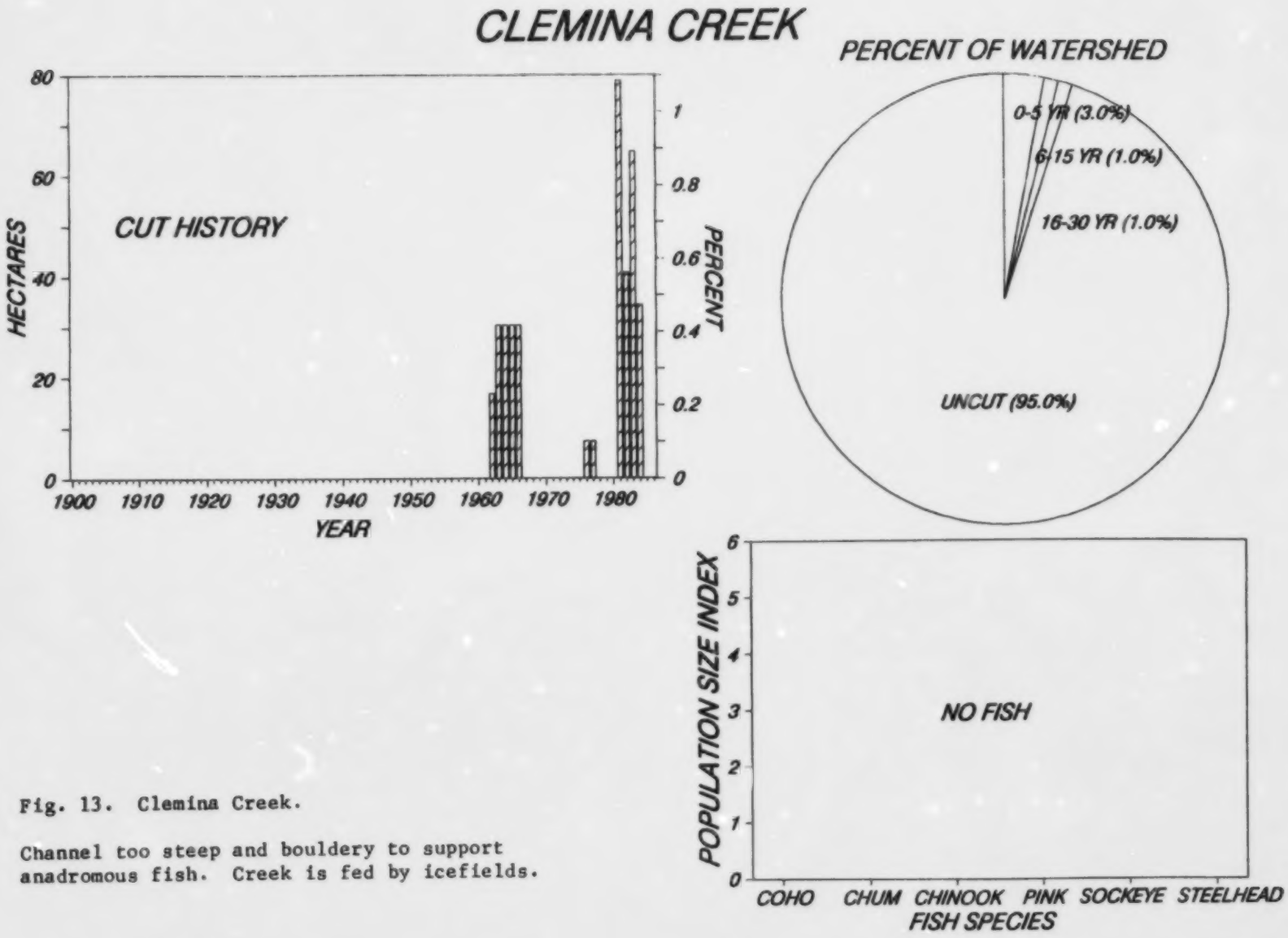


Fig. 13. Clemina Creek.

Channel too steep and bouldery to support anadromous fish. Creek is fed by icefields.

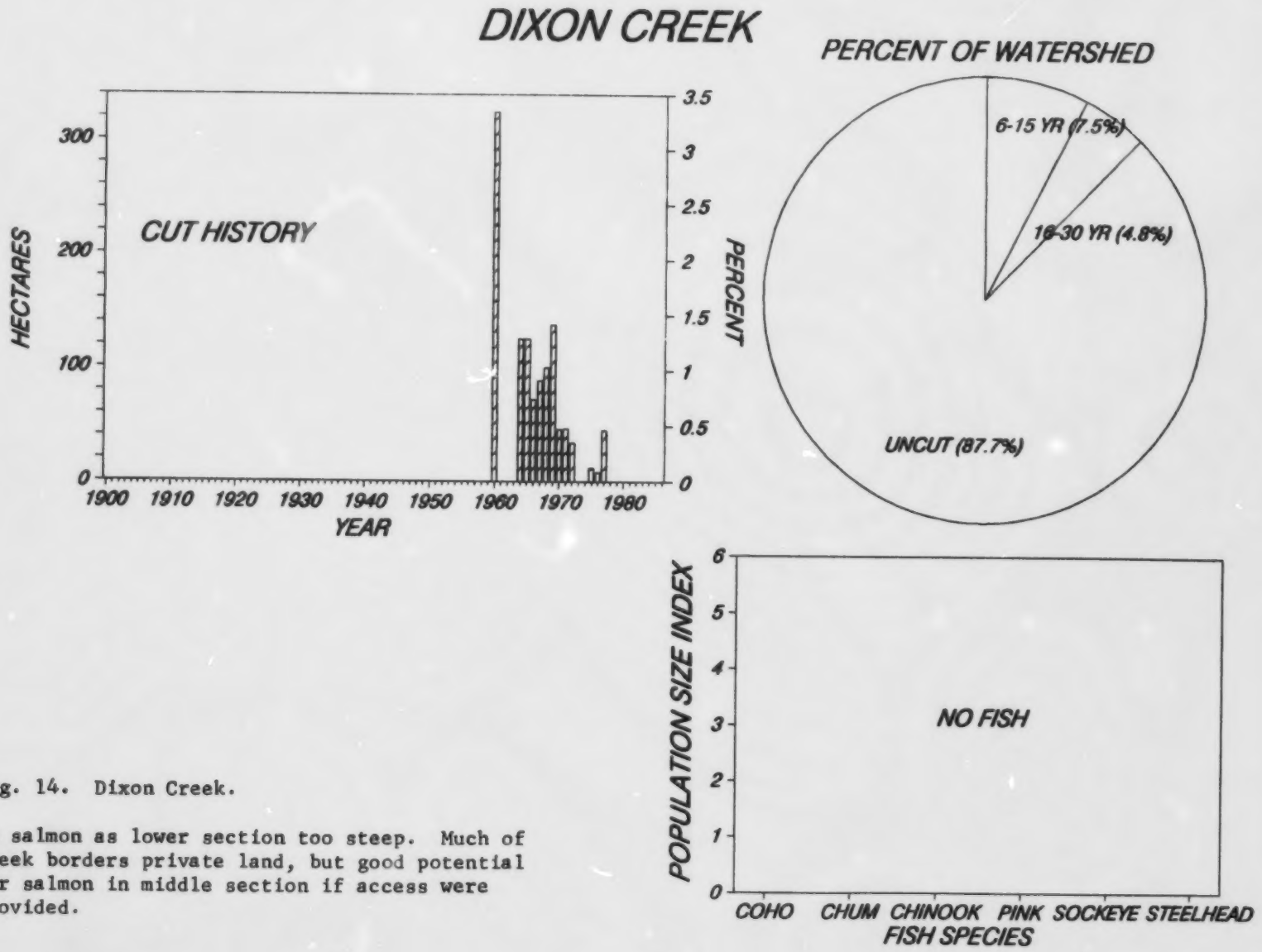


Fig. 14. Dixon Creek.

No salmon as lower section too steep. Much of creek borders private land, but good potential for salmon in middle section if access were provided.

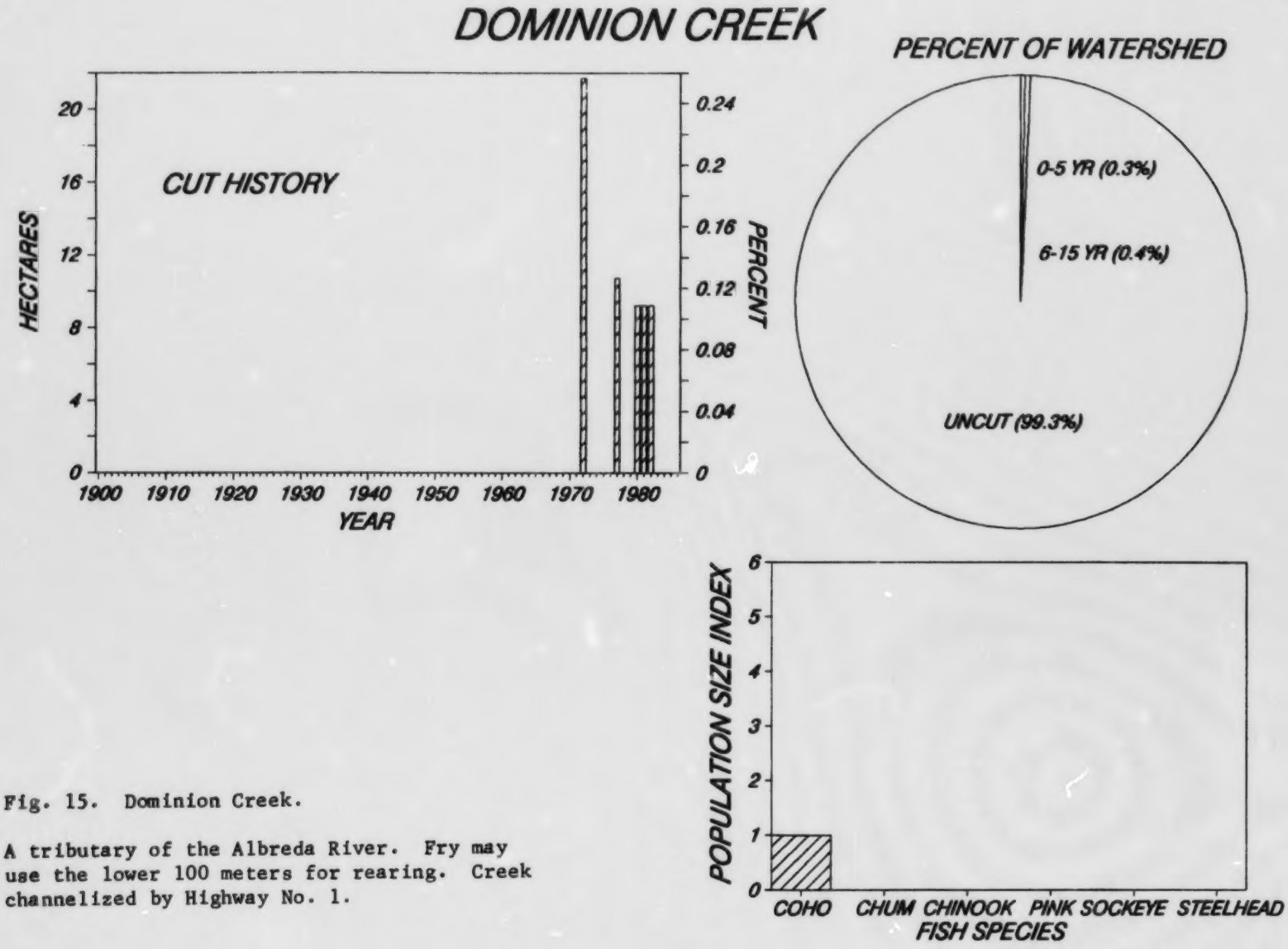


Fig. 15. Dominion Creek.

A tributary of the Albreda River. Fry may use the lower 100 meters for rearing. Creek channelized by Highway No. 1.

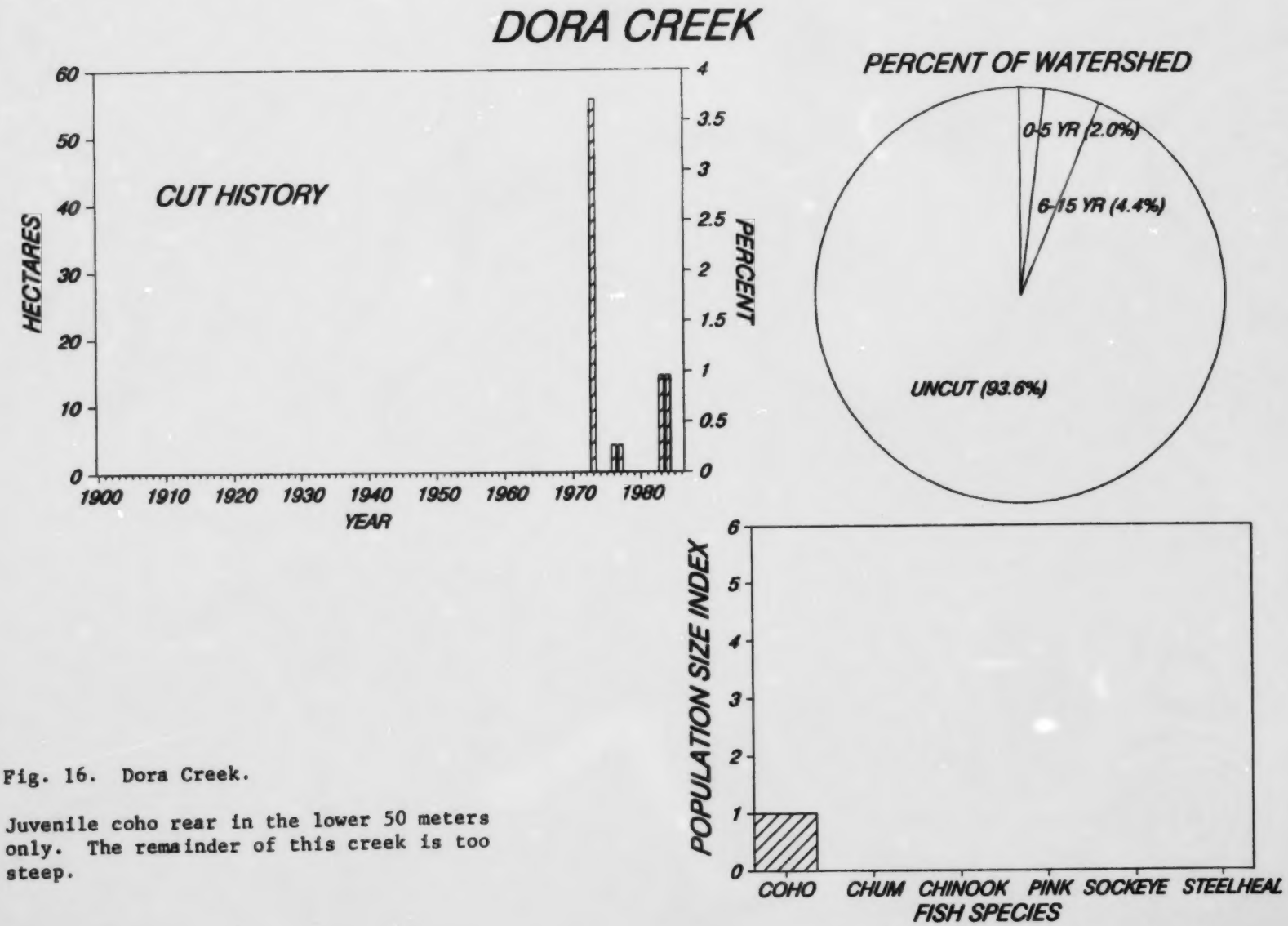


Fig. 16. Dora Creek.

Juvenile coho rear in the lower 50 meters only. The remainder of this creek is too steep.

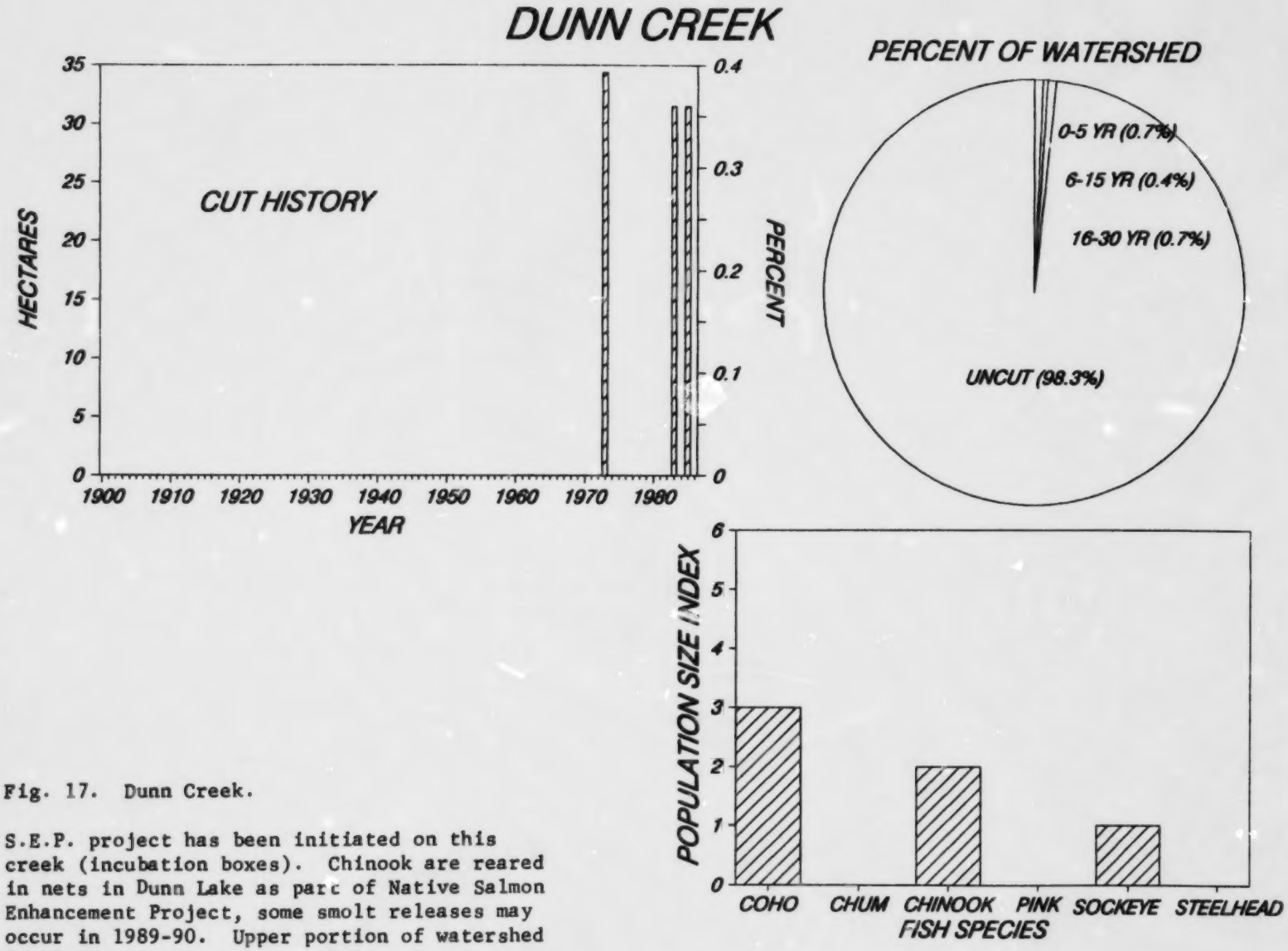


Fig. 17. Dunn Creek.

S.E.P. project has been initiated on this creek (incubation boxes). Chinook are reared in nets in Dunn Lake as part of Native Salmon Enhancement Project, some smolt releases may occur in 1989-90. Upper portion of watershed is steep.

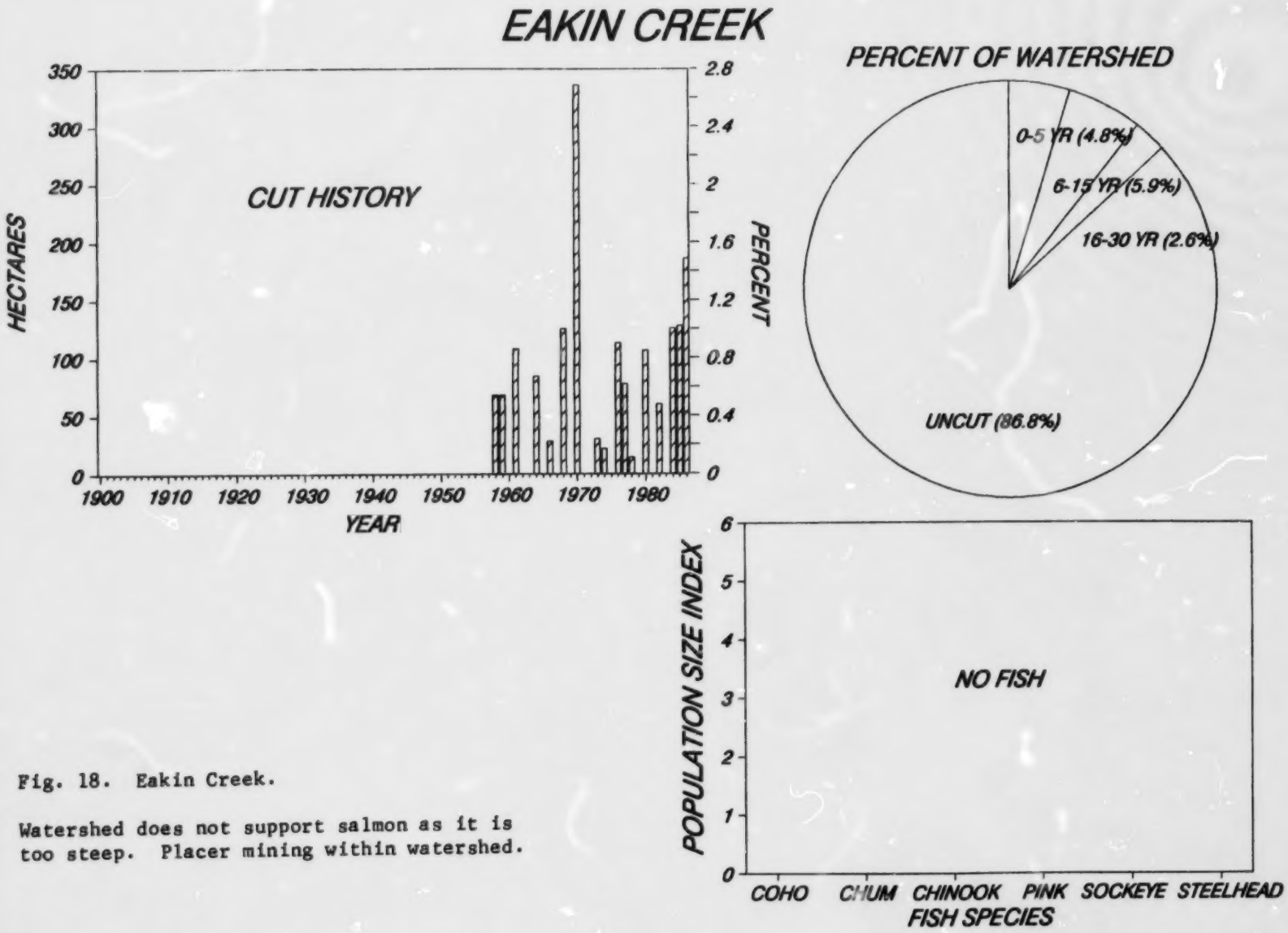


Fig. 18. Eakin Creek.

Watershed does not support salmon as it is too steep. Placer mining within watershed.

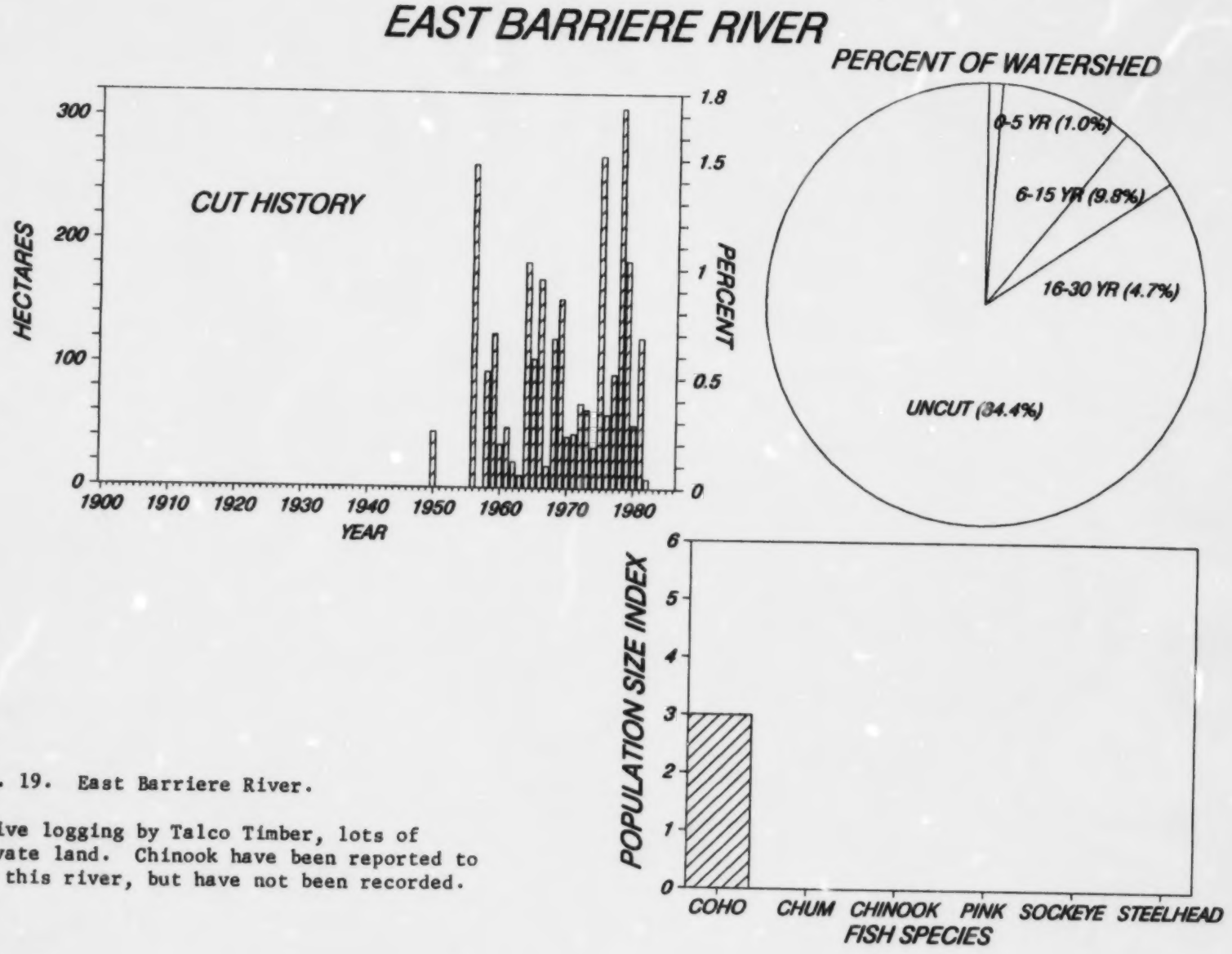


Fig. 19. East Barriere River.

Active logging by Talco Timber, lots of private land. Chinook have been reported to use this river, but have not been recorded.

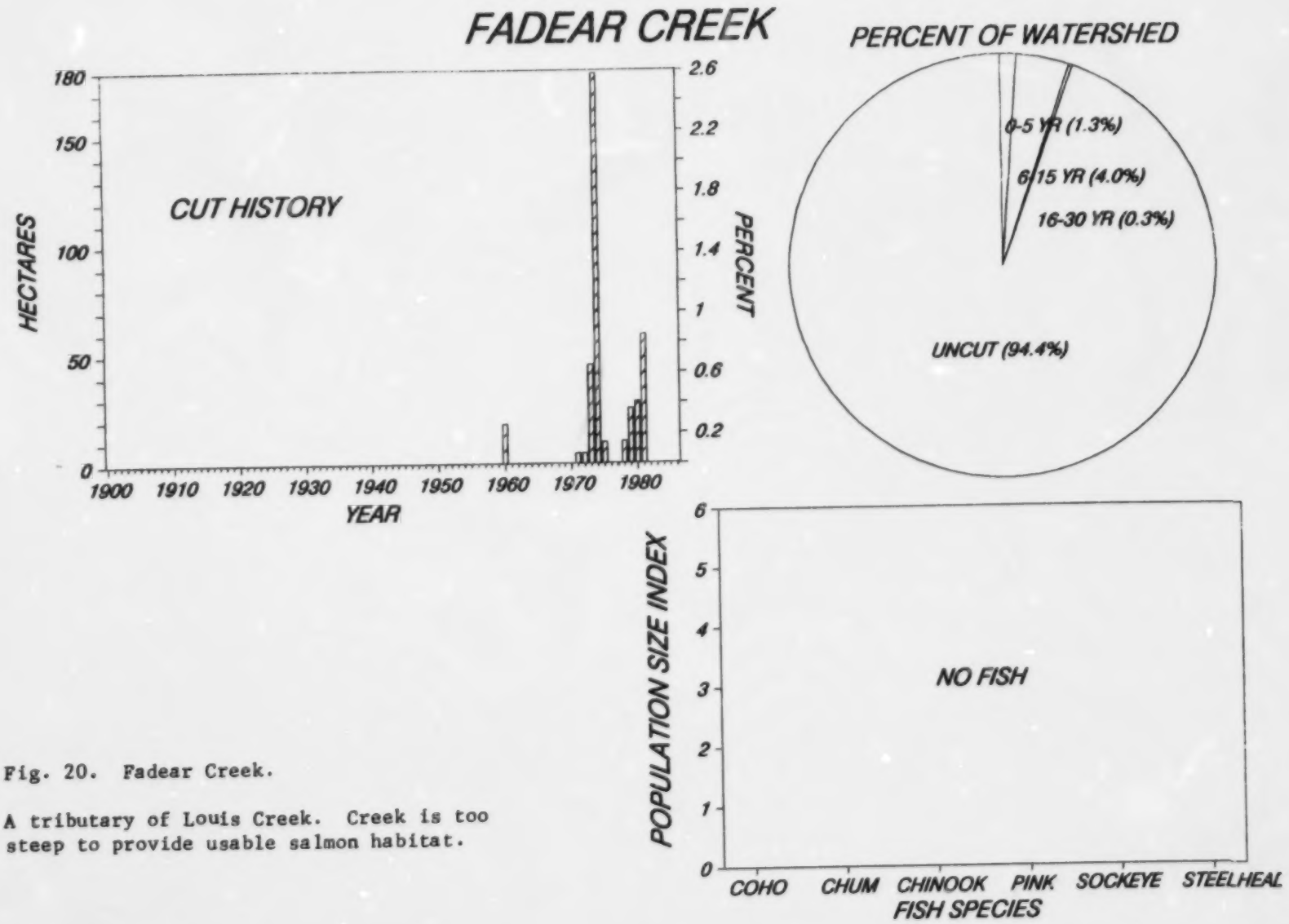


Fig. 20. Fadear Creek.

A tributary of Louis Creek. Creek is too steep to provide usable salmon habitat.

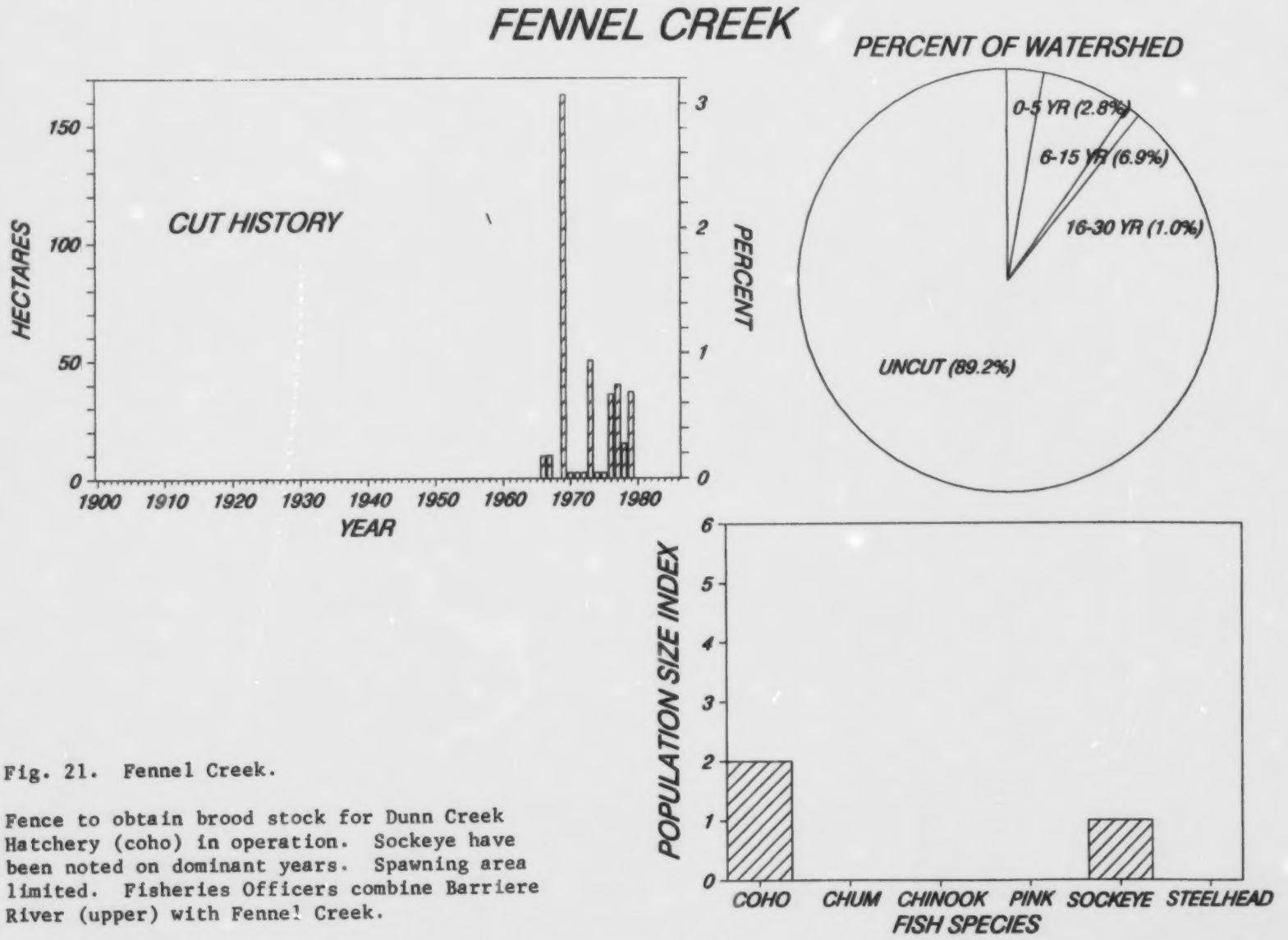


Fig. 21. Fennel Creek.

Fence to obtain brood stock for Dunn Creek Hatchery (coho) in operation. Sockeye have been noted on dominant years. Spawning area limited. Fisheries Officers combine Barriere River (upper) with Fennel Creek.

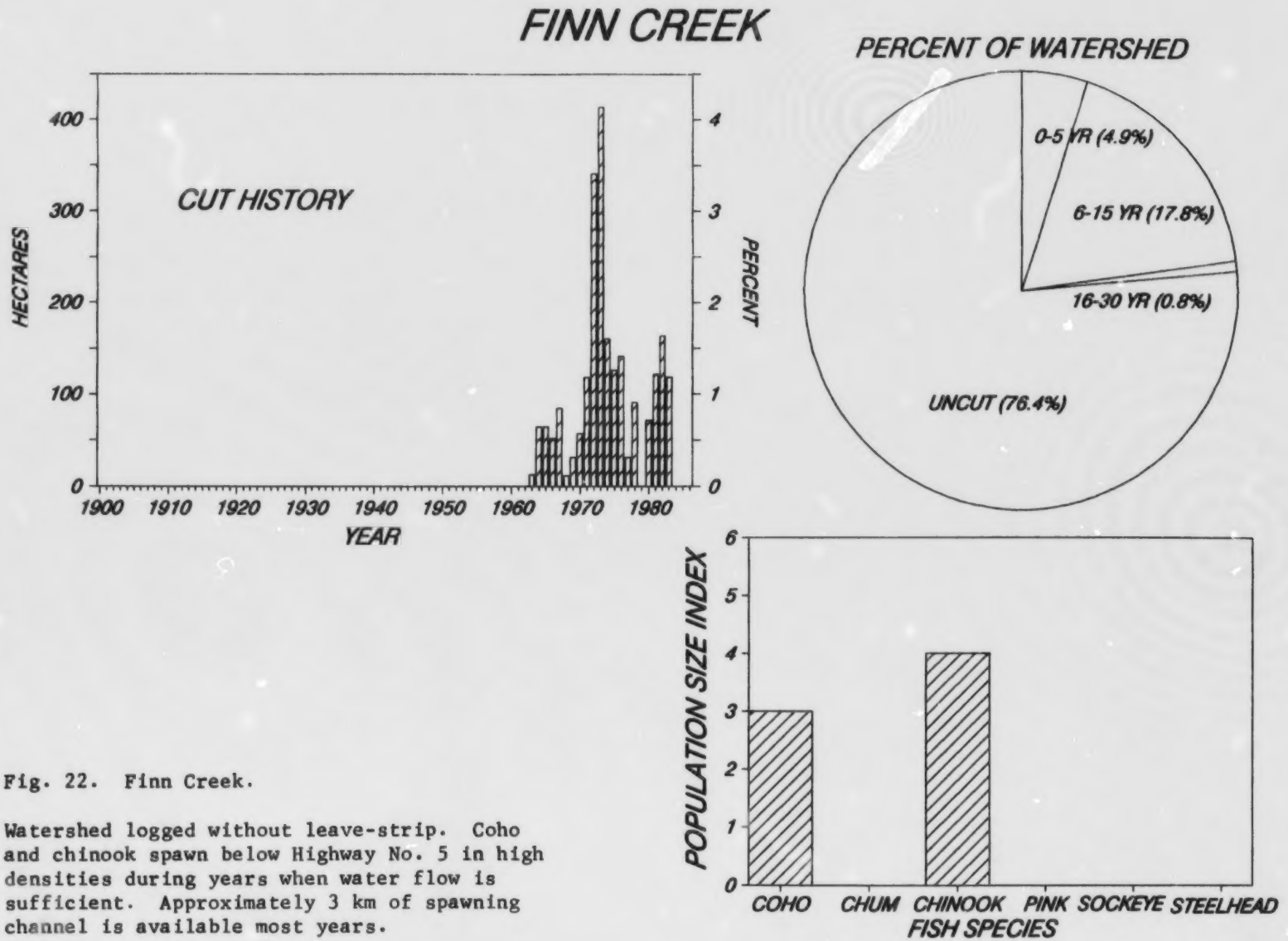


Fig. 22. Finn Creek.

Watershed logged without leave-strip. Coho and chinook spawn below Highway No. 5 in high densities during years when water flow is sufficient. Approximately 3 km of spawning channel is available most years.

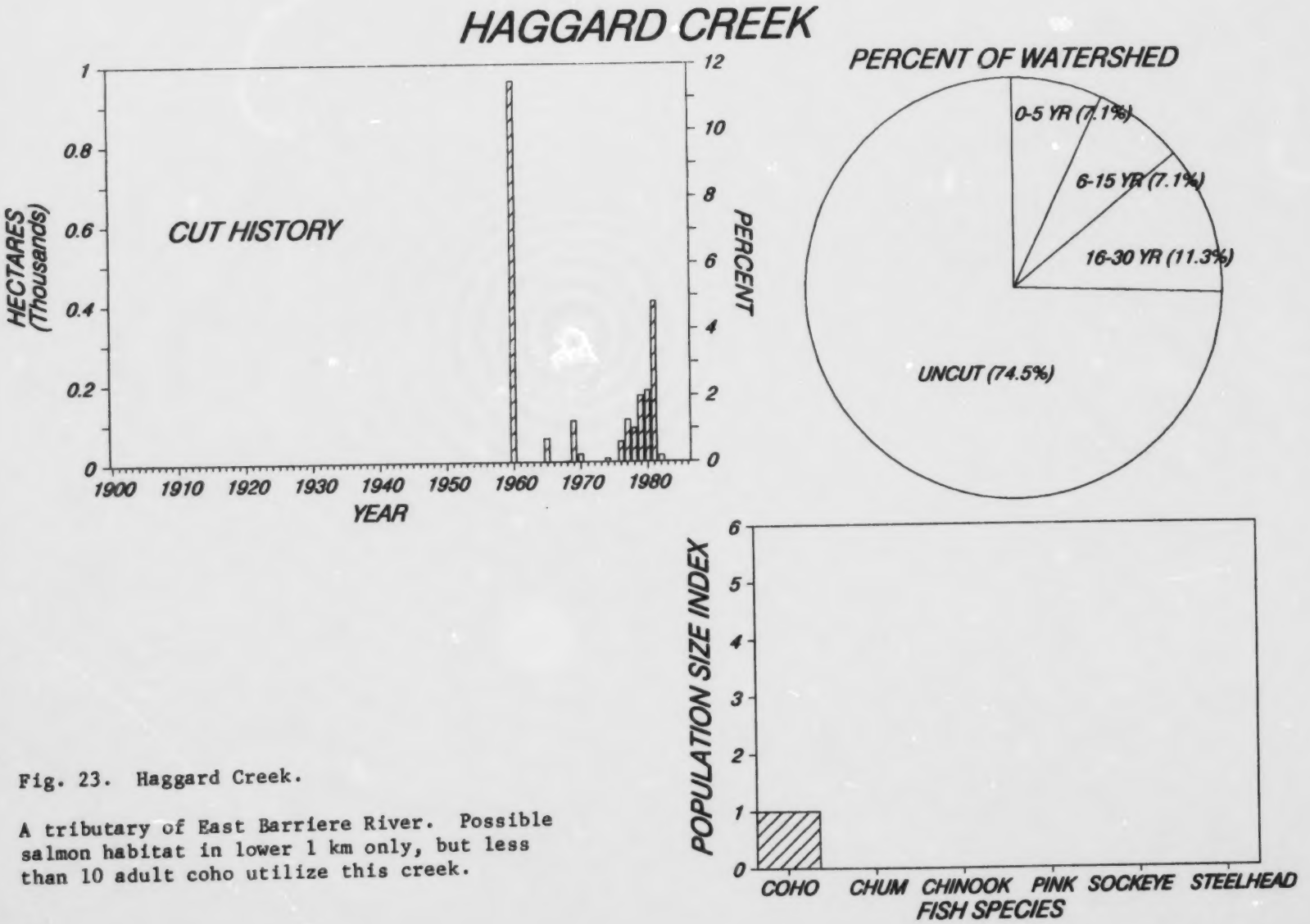


Fig. 23. Haggard Creek.

A tributary of East Barriere River. Possible salmon habitat in lower 1 km only, but less than 10 adult coho utilize this creek.

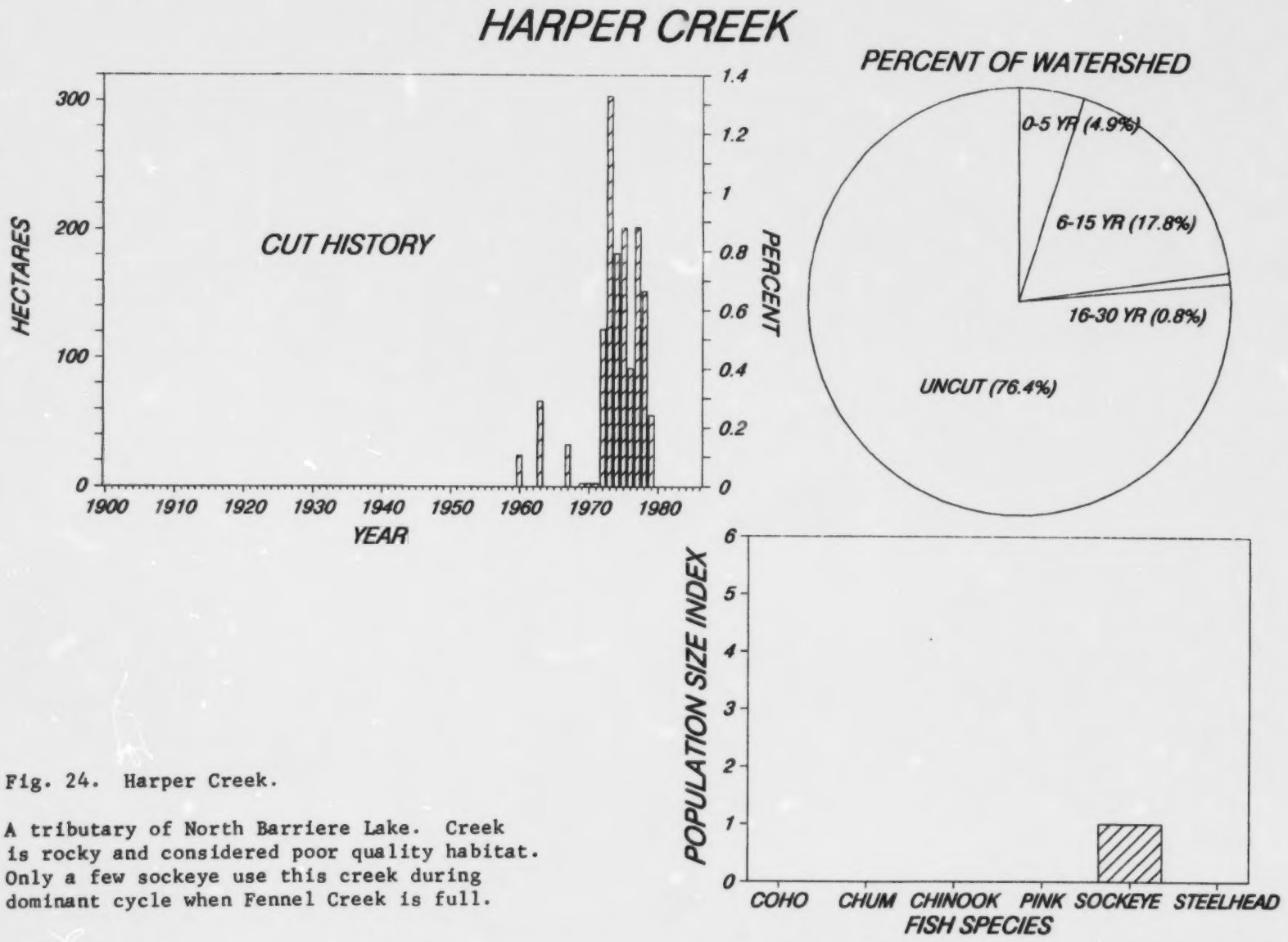


Fig. 24. Harper Creek.

A tributary of North Barriere Lake. Creek is rocky and considered poor quality habitat. Only a few sockeye use this creek during dominant cycle when Fennel Creek is full.

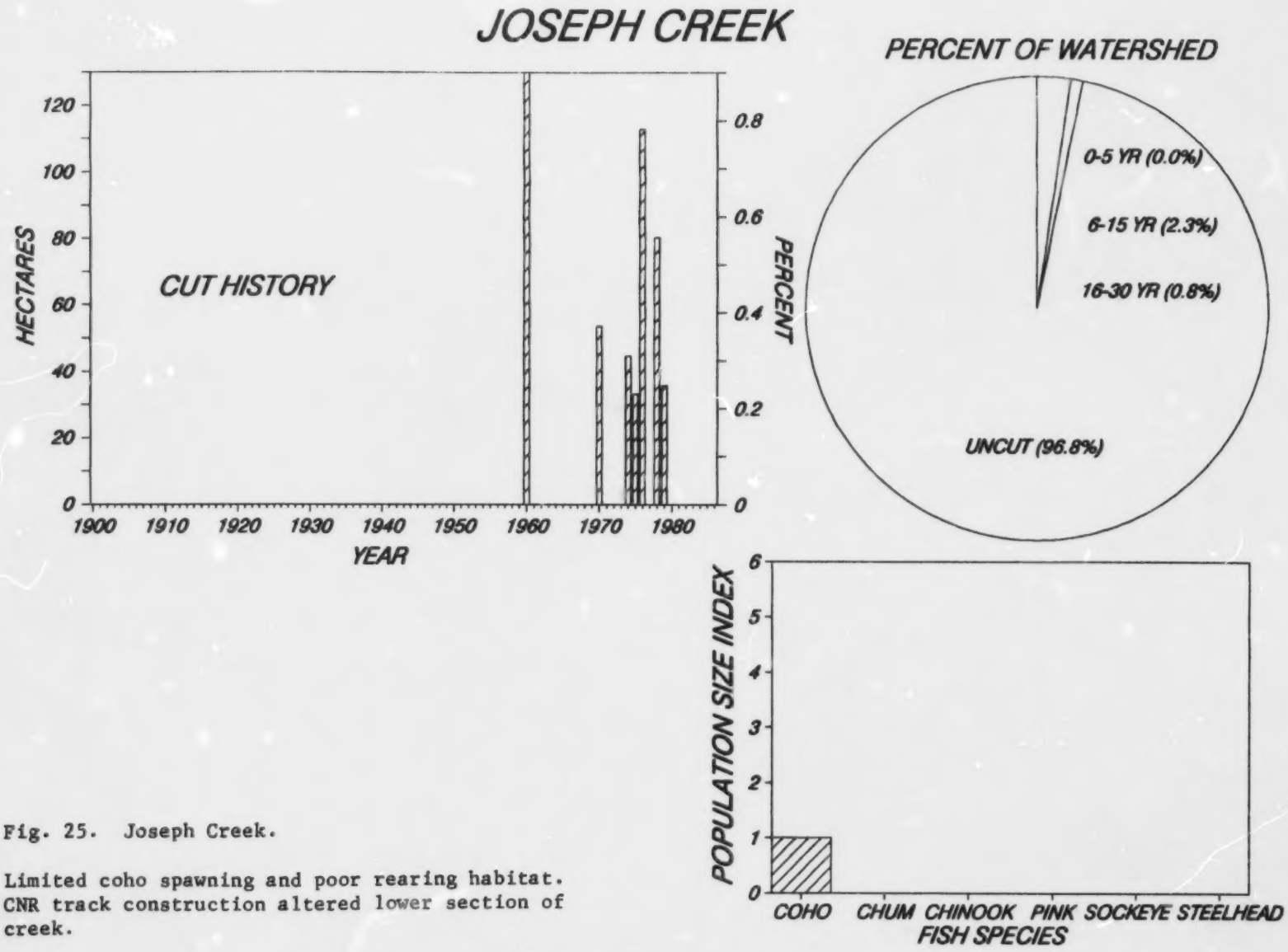
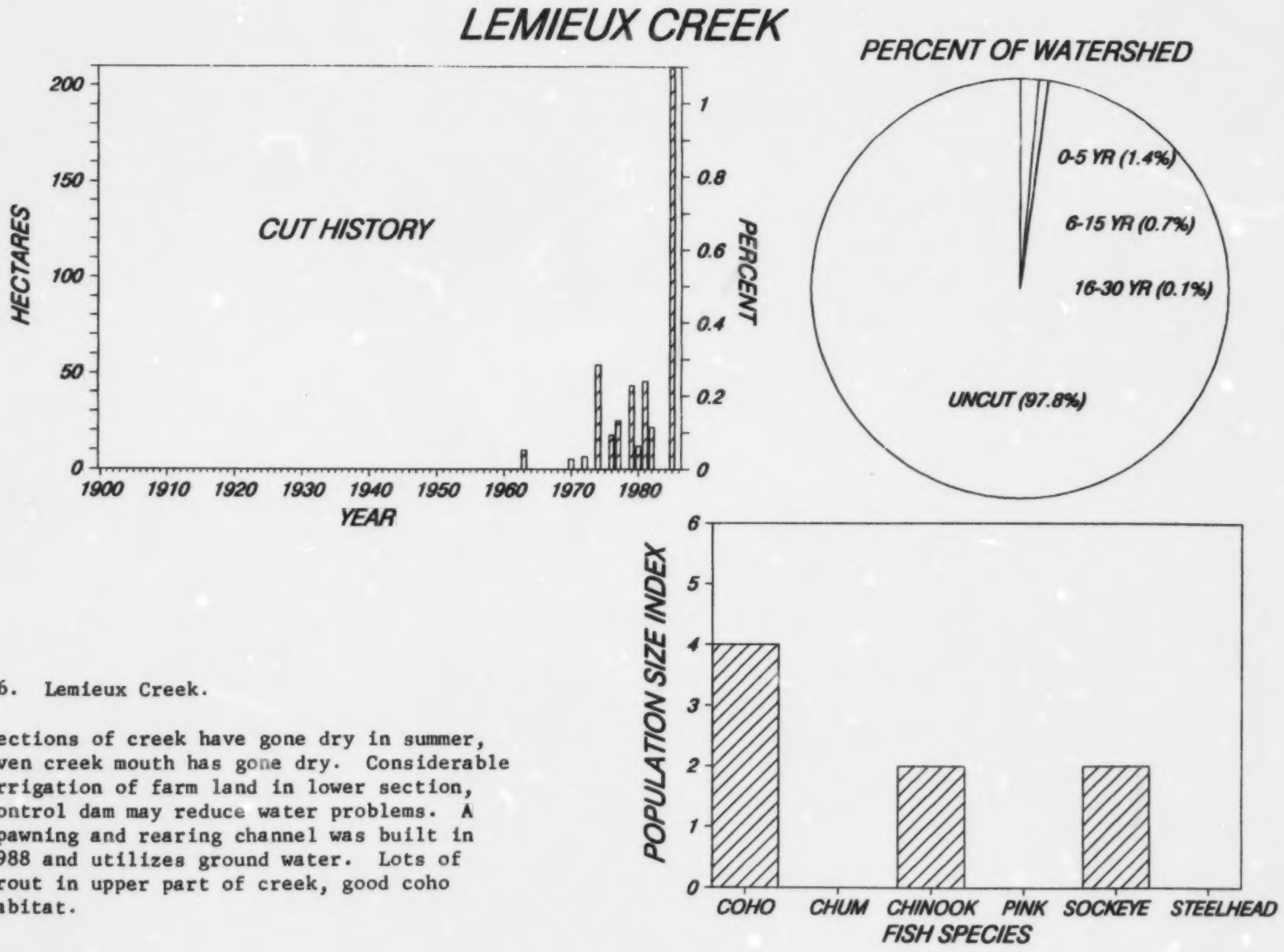


Fig. 25. Joseph Creek.

Limited coho spawning and poor rearing habitat. CNR track construction altered lower section of creek.



26. Lemieux Creek.

Sections of creek have gone dry in summer, even creek mouth has gone dry. Considerable irrigation of farm land in lower section, control dam may reduce water problems. A spawning and rearing channel was built in 1988 and utilizes ground water. Lots of trout in upper part of creek, good coho habitat.

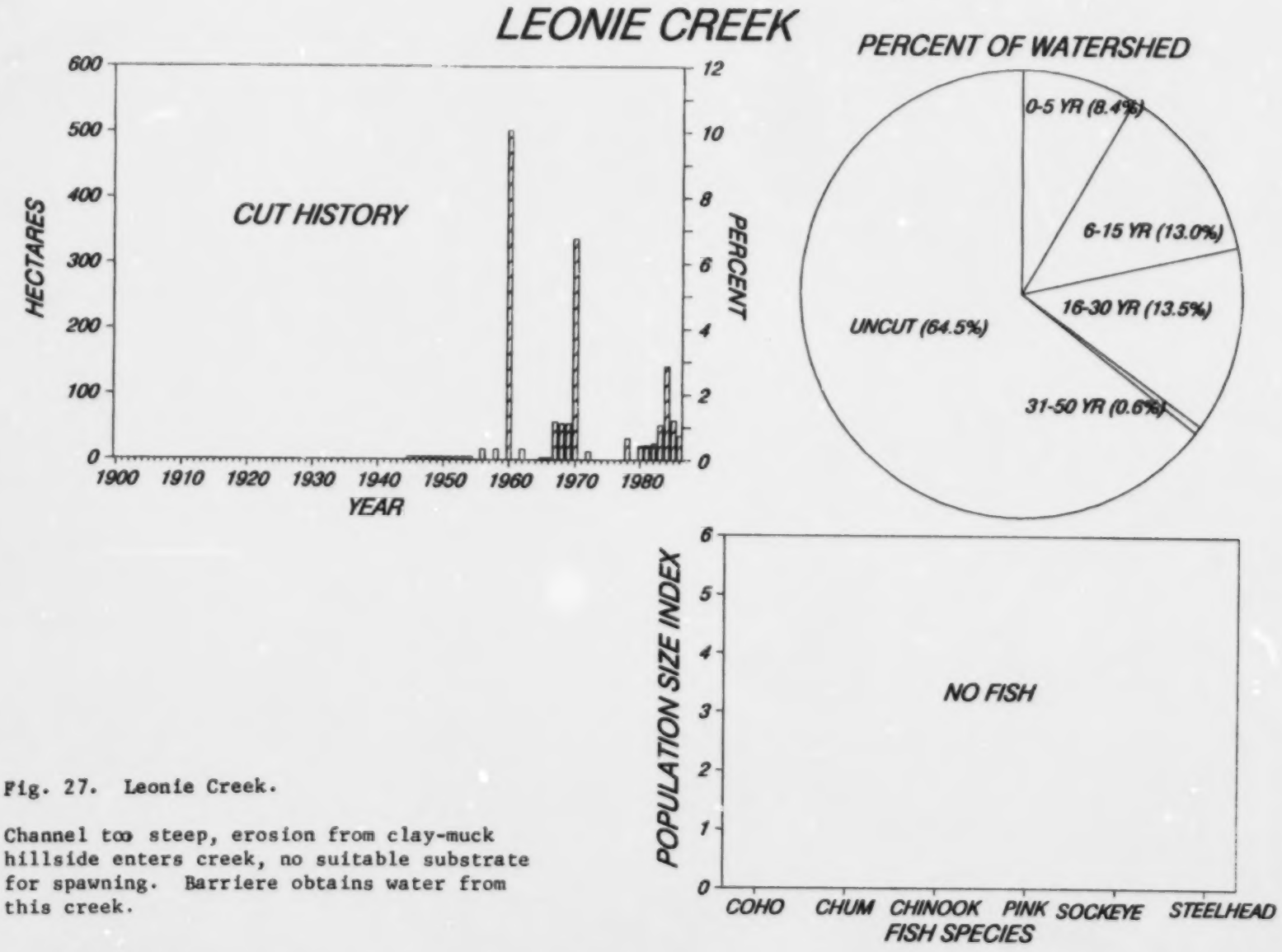


Fig. 27. Leonie Creek.

Channel too steep, erosion from clay-muck hillside enters creek, no suitable substrate for spawning. Barriere obtains water from this creek.

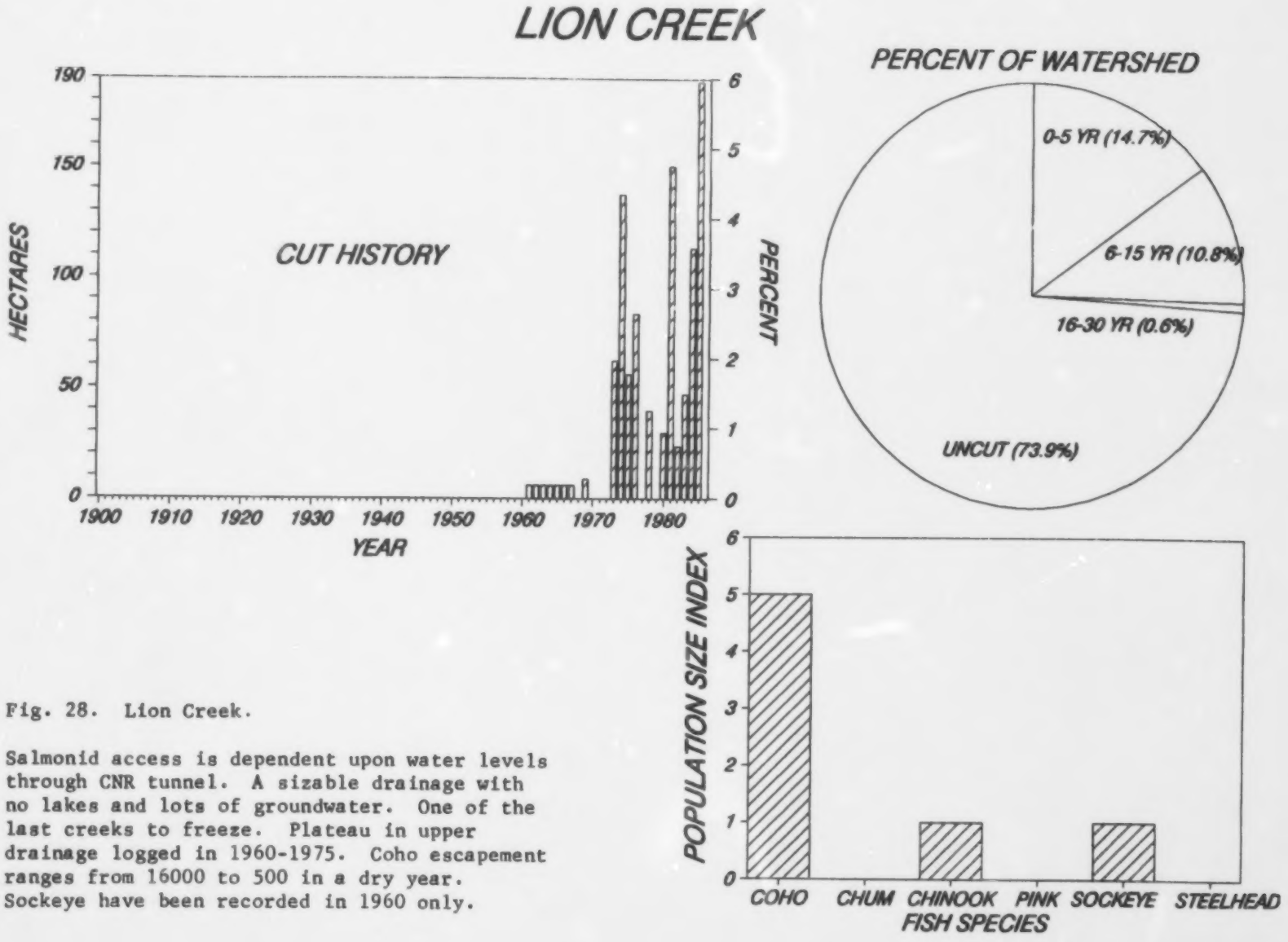


Fig. 28. Lion Creek.

Salmonid access is dependent upon water levels through CNR tunnel. A sizable drainage with no lakes and lots of groundwater. One of the last creeks to freeze. Plateau in upper drainage logged in 1960-1975. Coho escapement ranges from 16000 to 500 in a dry year. Sockeye have been recorded in 1960 only.

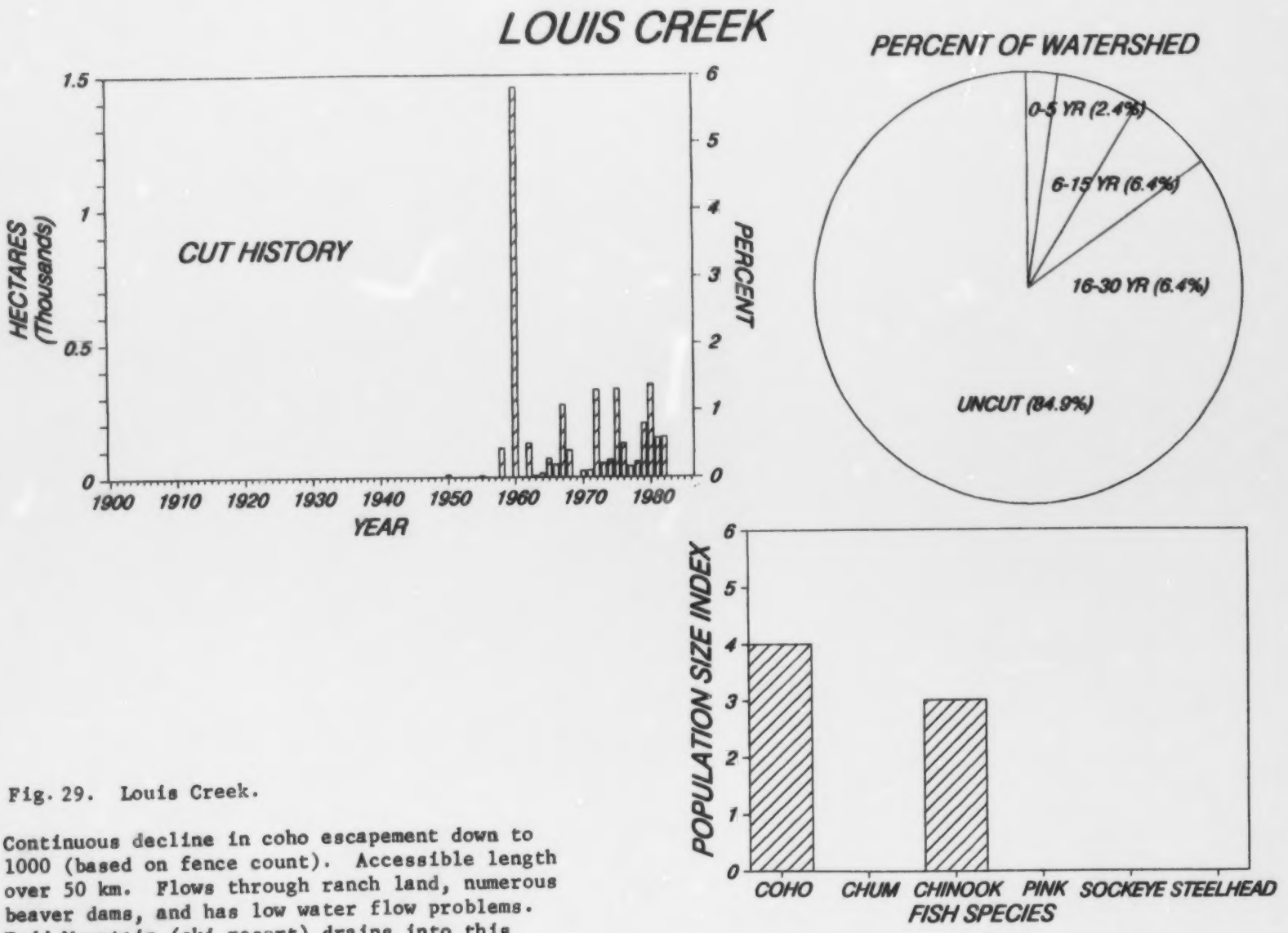


Fig. 29. Louis Creek.

Continuous decline in coho escapement down to 1000 (based on fence count). Accessible length over 50 km. Flows through ranch land, numerous beaver dams, and has low water flow problems. Todd Mountain (ski resort) drains into this creek.

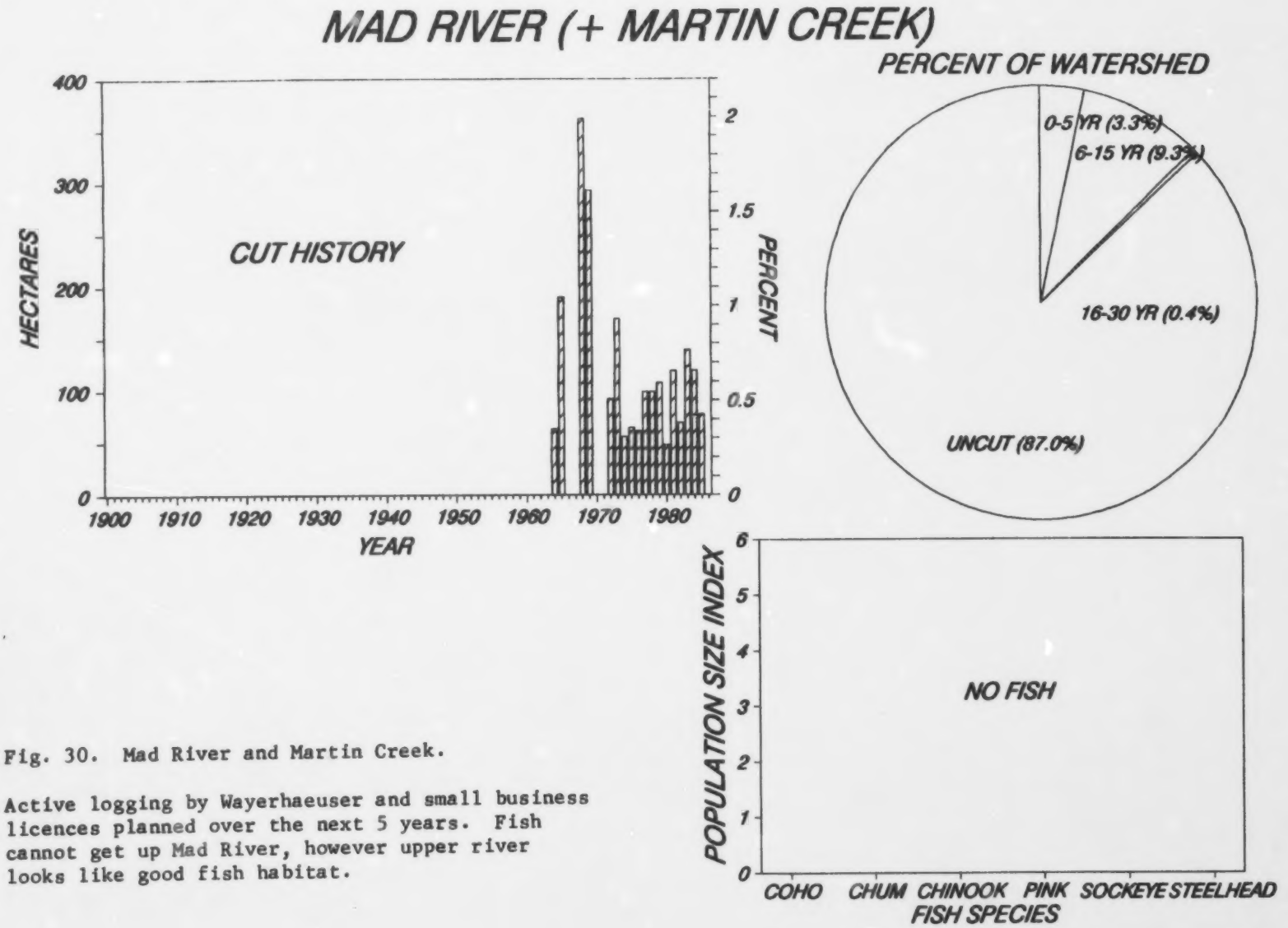


Fig. 30. Mad River and Martin Creek.

Active logging by Wayerhaeuser and small business licences planned over the next 5 years. Fish cannot get up Mad River, however upper river looks like good fish habitat.

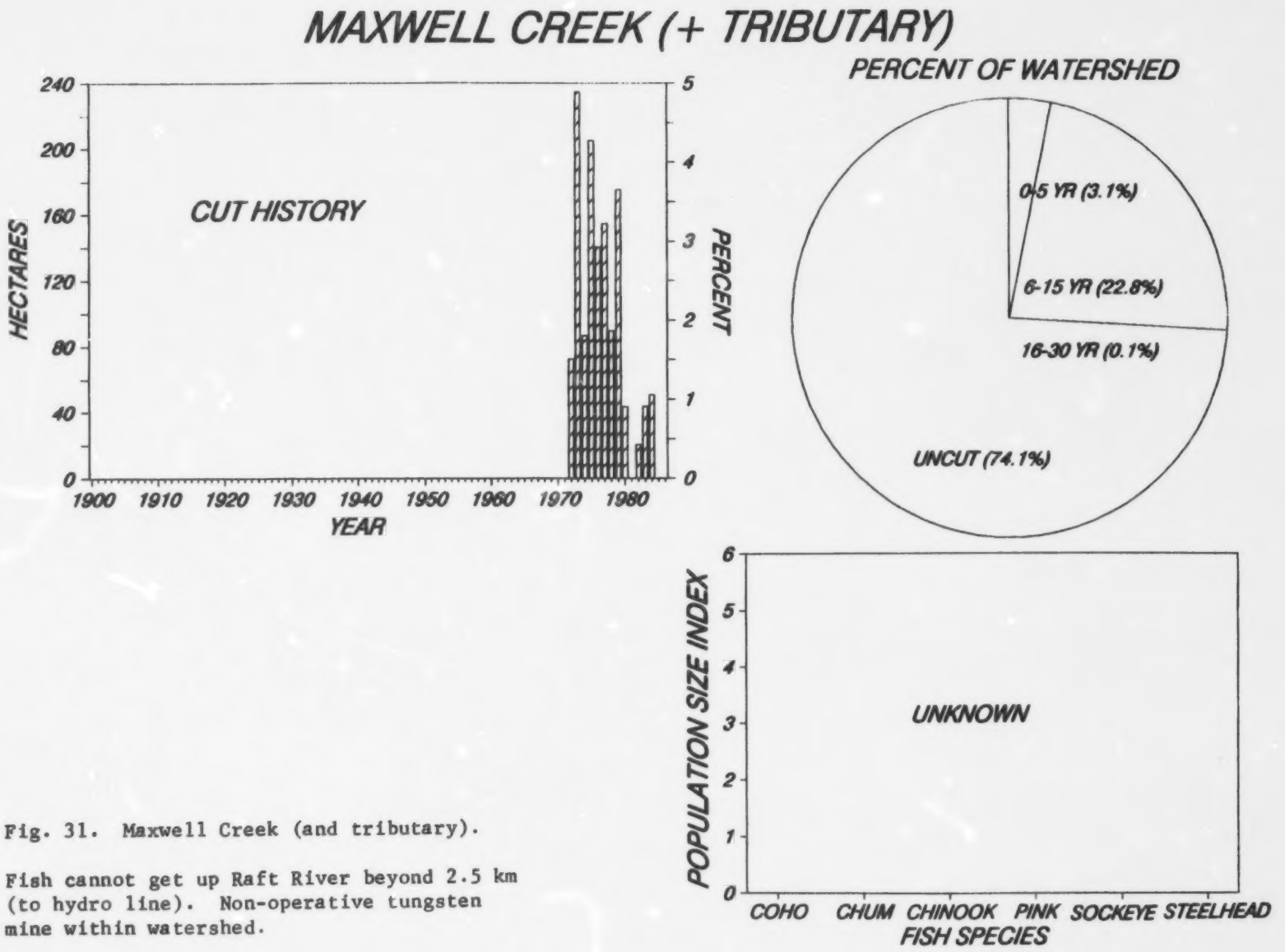


Fig. 31. Maxwell Creek (and tributary).

Fish cannot get up Raft River beyond 2.5 km (to hydro line). Non-operative tungsten mine within watershed.

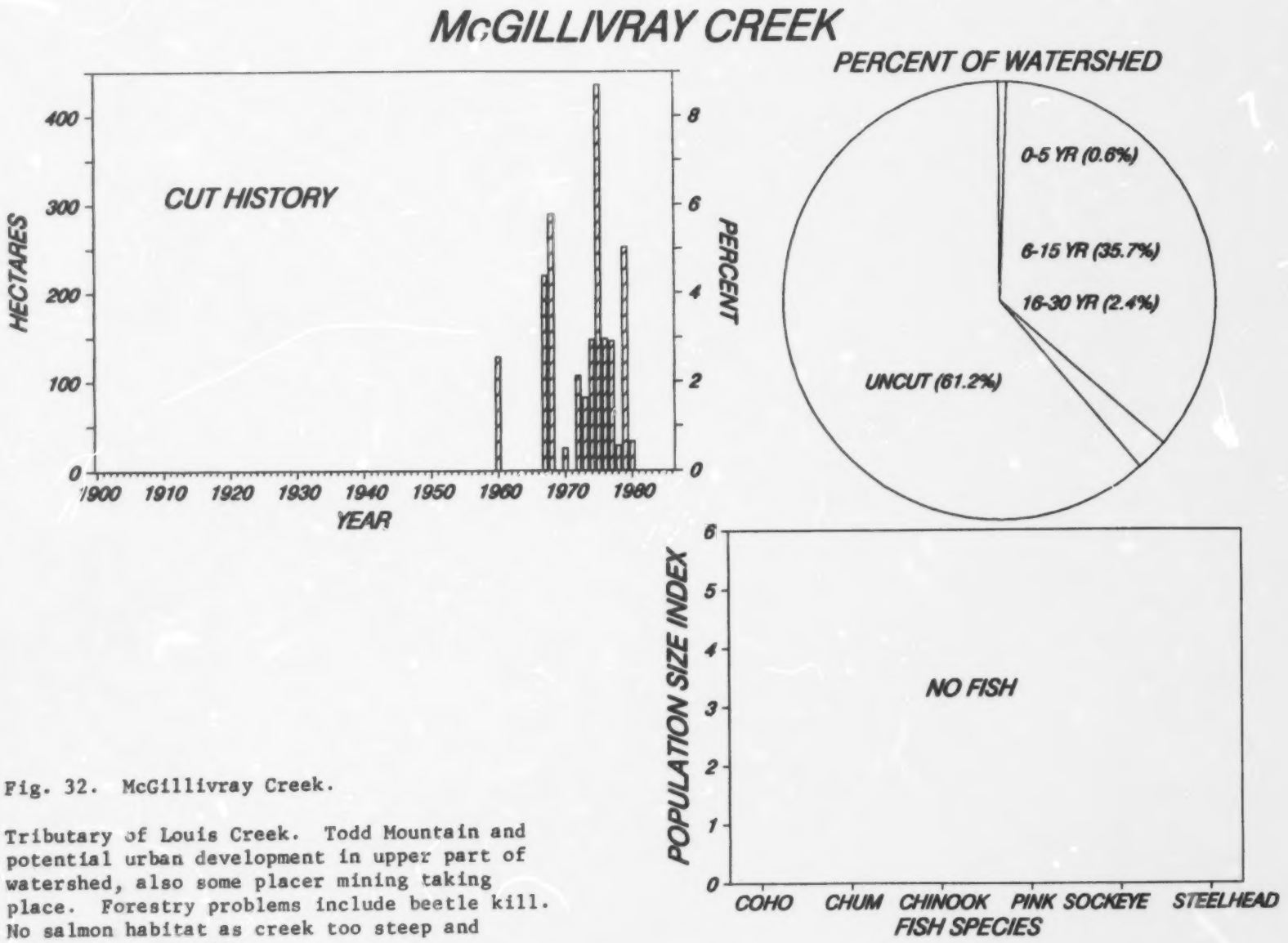


Fig. 32. McGillivray Creek.

Tributary of Louis Creek. Todd Mountain and potential urban development in upper part of watershed, also some placer mining taking place. Forestry problems include beetle kill. No salmon habitat as creek too steep and substrate too bouldery.

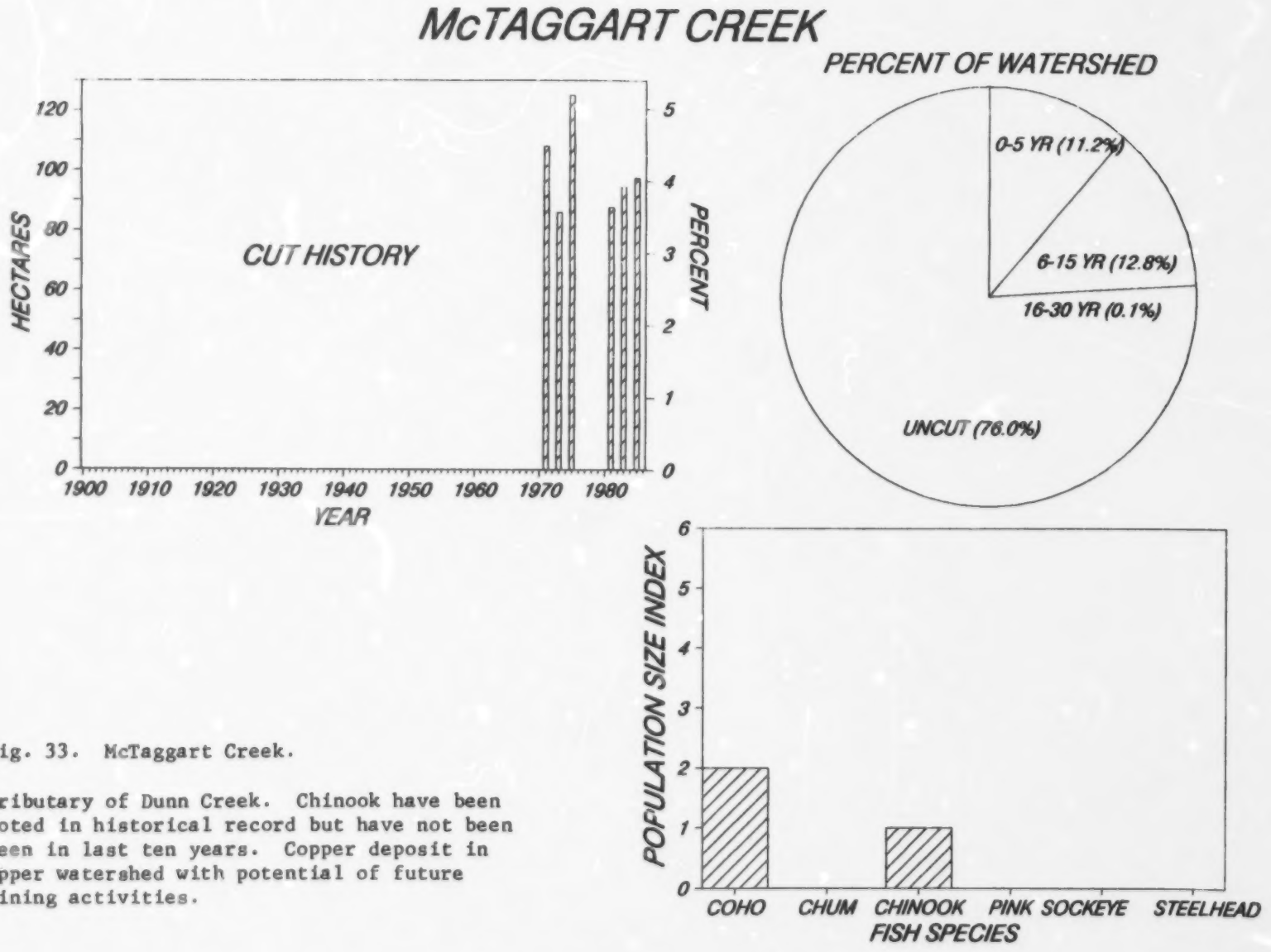


Fig. 33. McTaggart Creek.

Tributary of Dunn Creek. Chinook have been noted in historical record but have not been seen in last ten years. Copper deposit in upper watershed with potential of future mining activities.

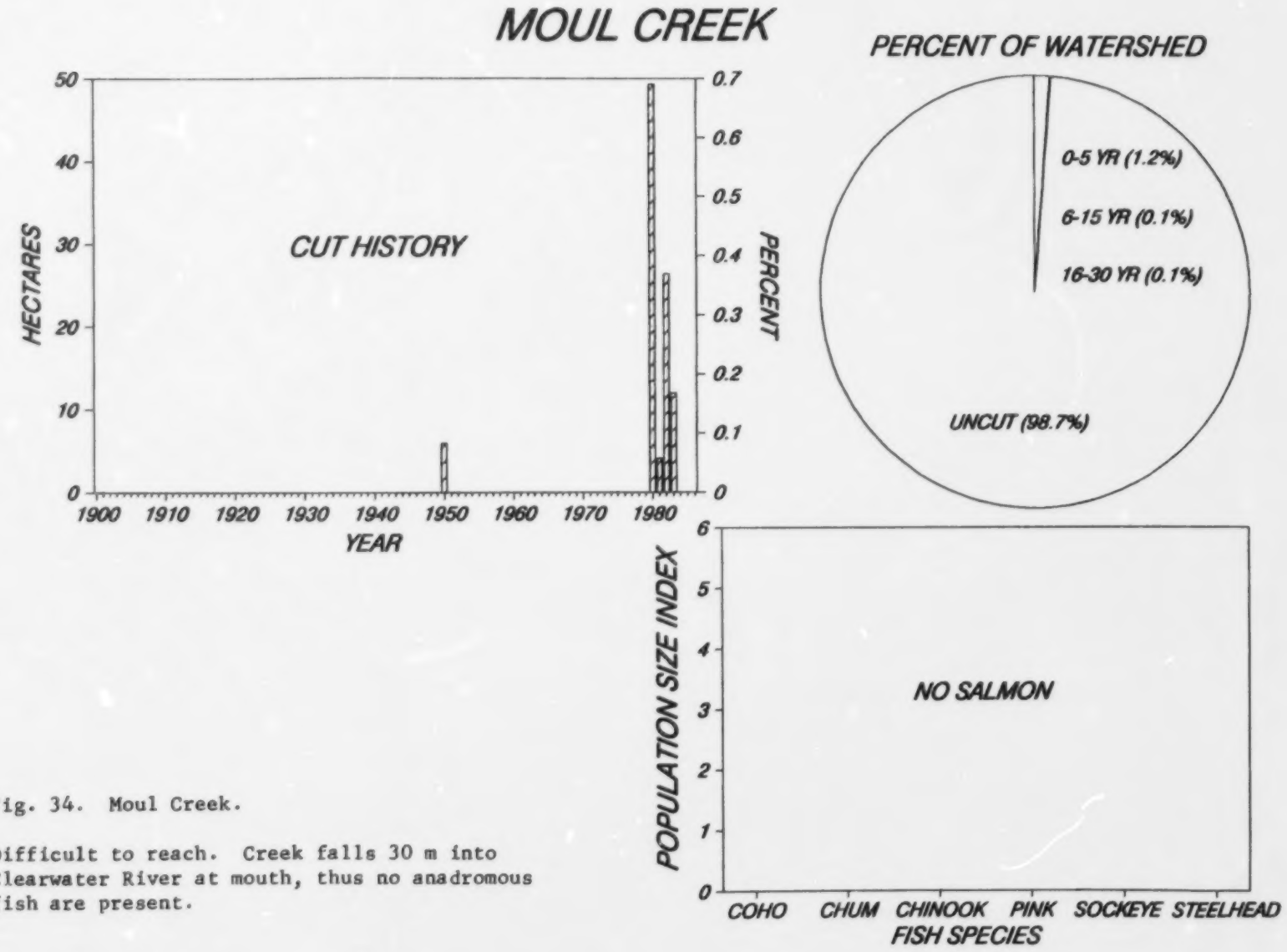


Fig. 34. Moul Creek.

Difficult to reach. Creek falls 30 m into Clearwater River at mouth, thus no anadromous fish are present.

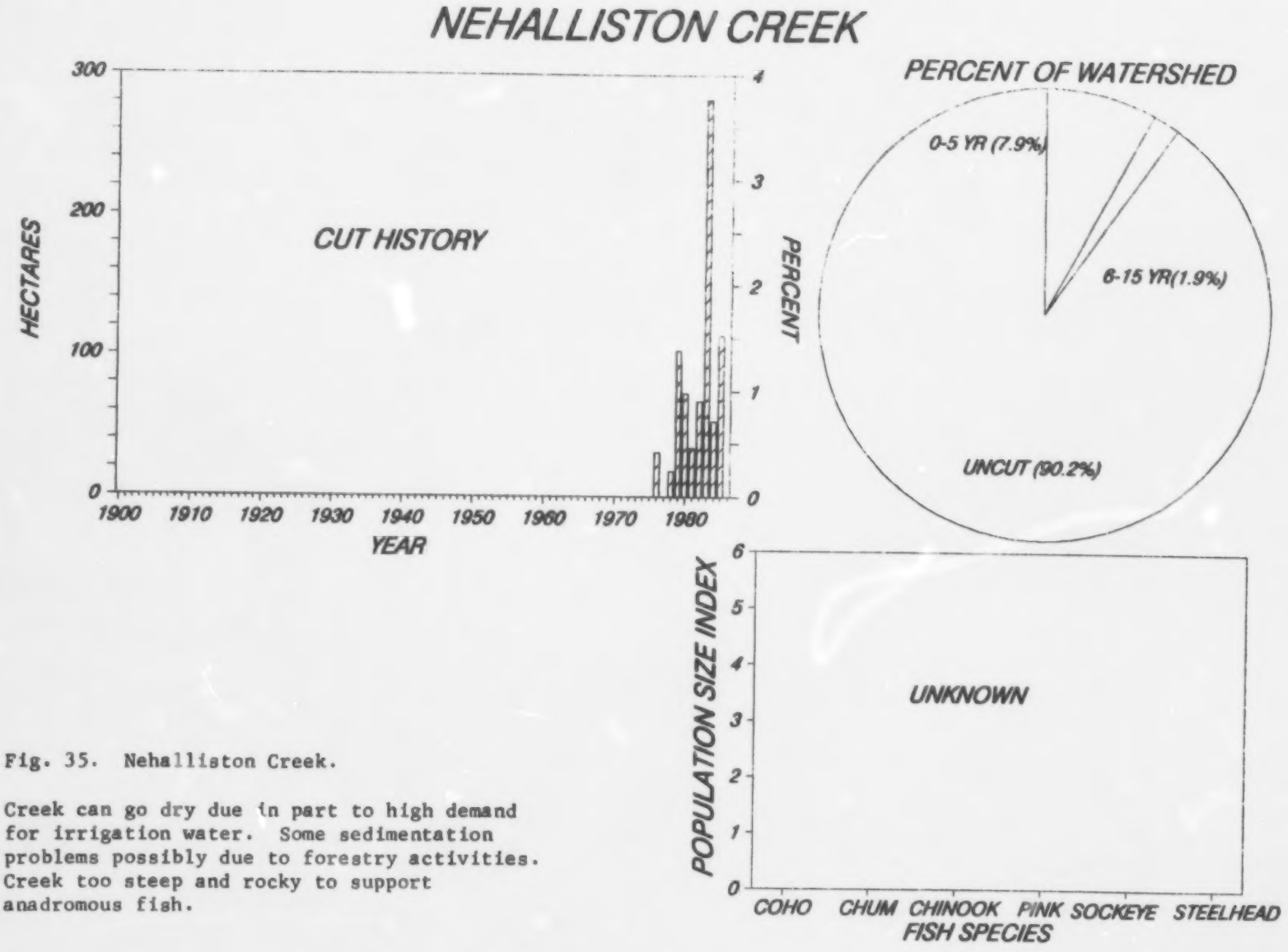


Fig. 35. Nehalliston Creek.

Creek can go dry due in part to high demand for irrigation water. Some sedimentation problems possibly due to forestry activities. Creek too steep and rocky to support anadromous fish.

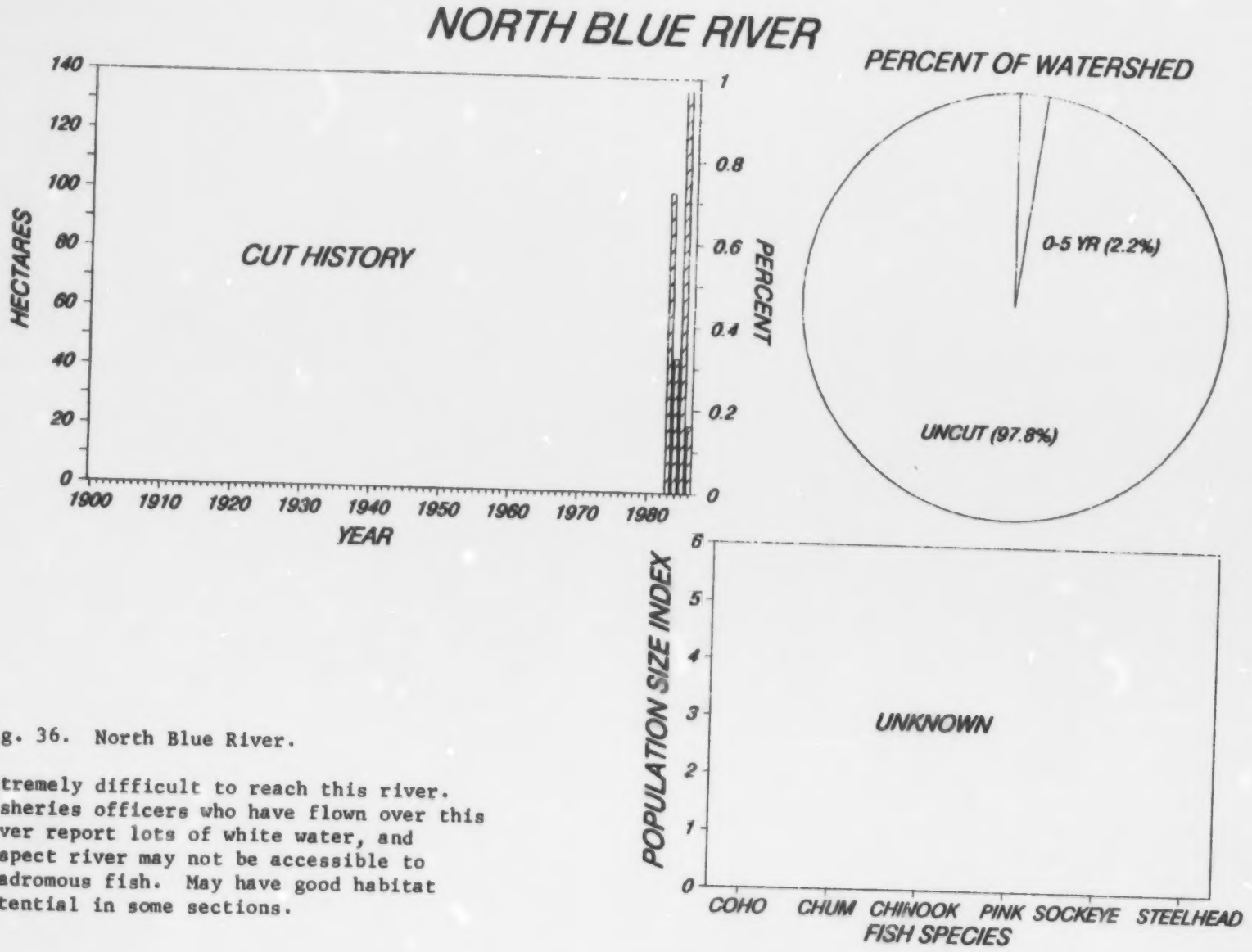


Fig. 36. North Blue River.

Extremely difficult to reach this river. Fisheries officers who have flown over this river report lots of white water, and suspect river may not be accessible to anadromous fish. May have good habitat potential in some sections.

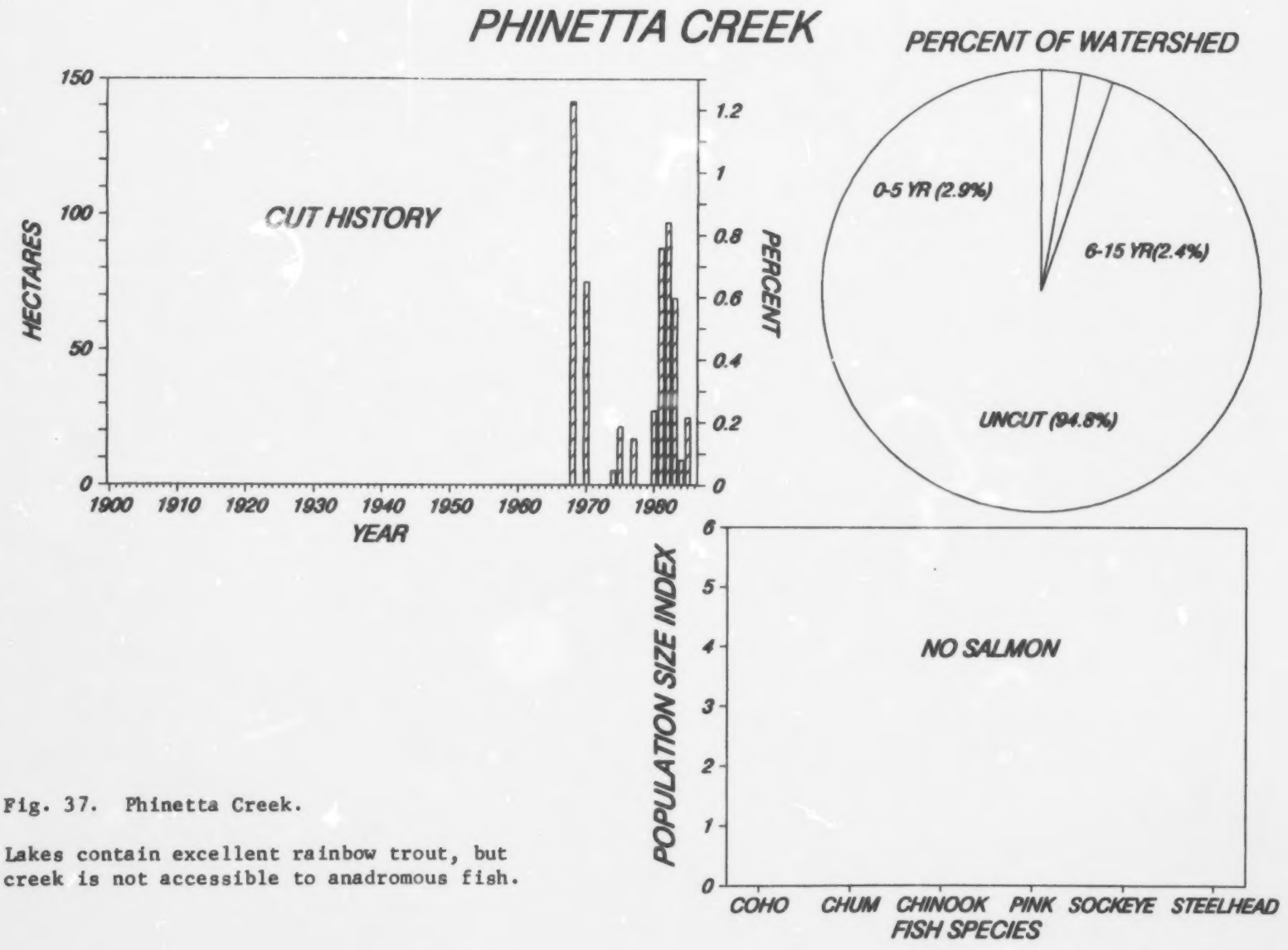


Fig. 37. Phinetta Creek.

Lakes contain excellent rainbow trout, but creek is not accessible to anadromous fish.

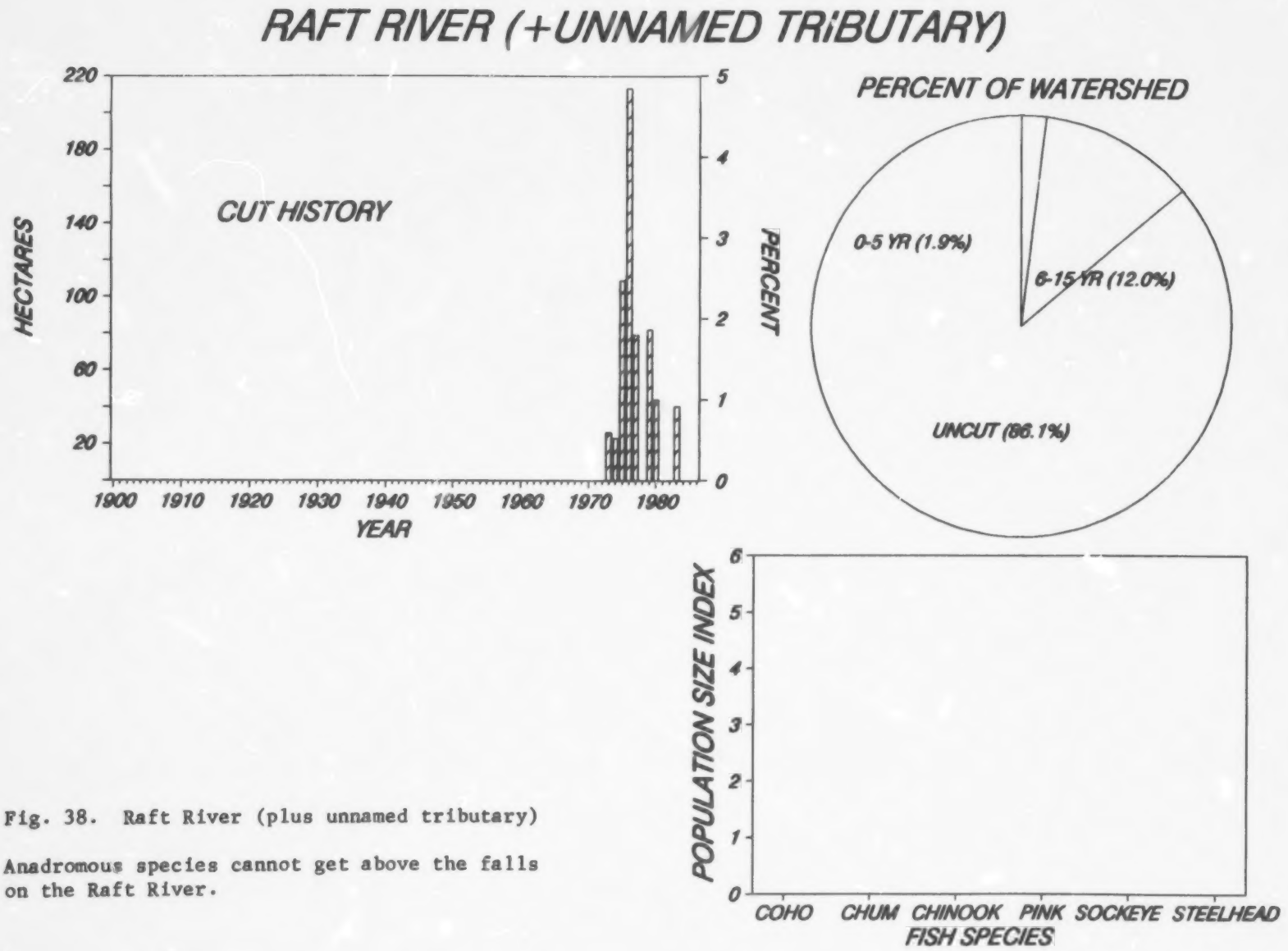


Fig. 38. Raft River (plus unnamed tributary)

Anadromous species cannot get above the falls on the Raft River.

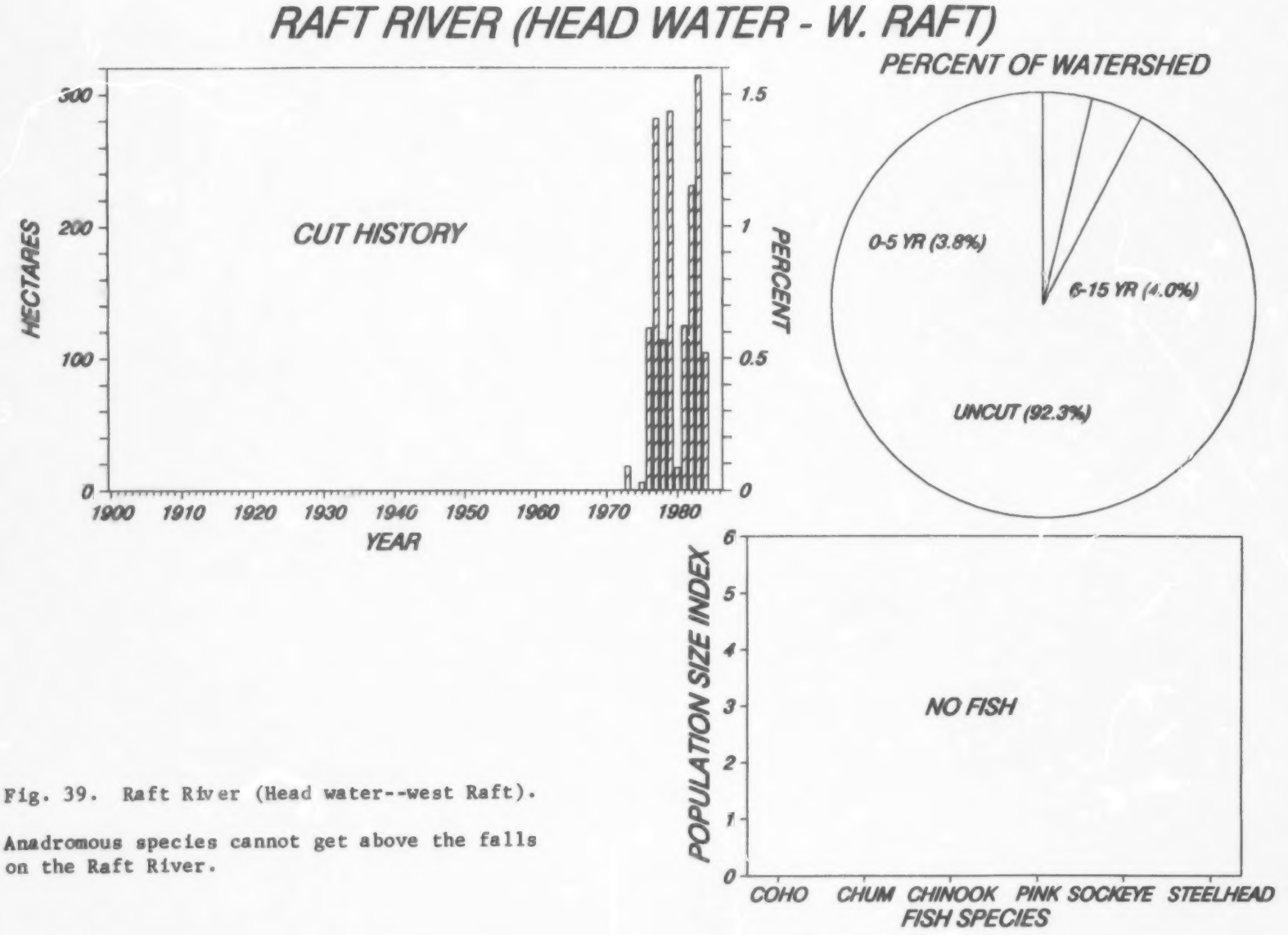


Fig. 39. Raft River (Head water--west Raft).

Anadromous species cannot get above the falls on the Raft River.

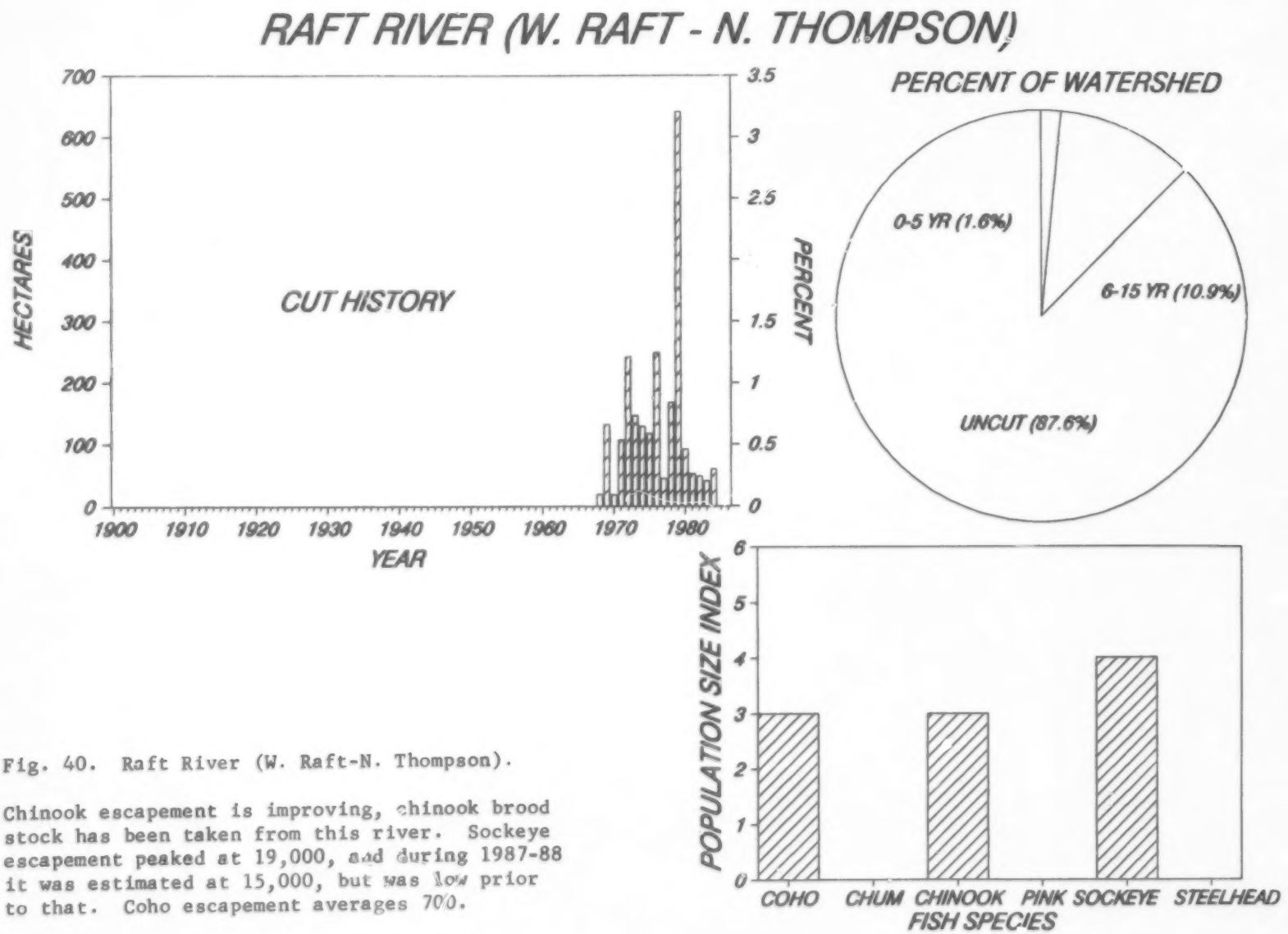


Fig. 40. Raft River (W. Raft-N. Thompson).

Chinook escapement is improving, chinook brood stock has been taken from this river. Sockeye escapement peaked at 19,000, and during 1987-88 it was estimated at 15,000, but was low prior to that. Coho escapement averages 700.

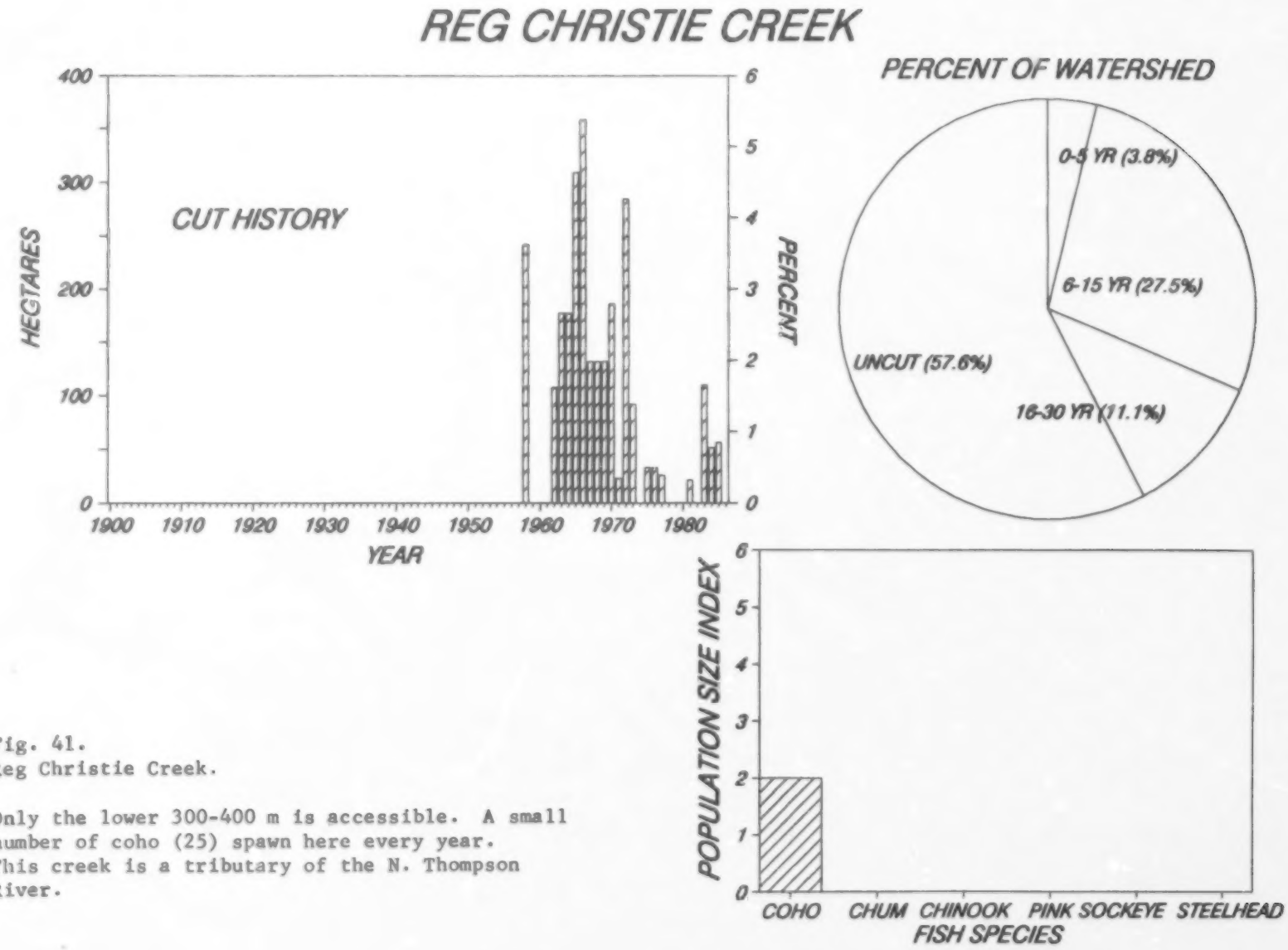


Fig. 41.
Reg Christie Creek.

Only the lower 300-400 m is accessible. A small number of coho (25) spawn here every year. This creek is a tributary of the N. Thompson River.

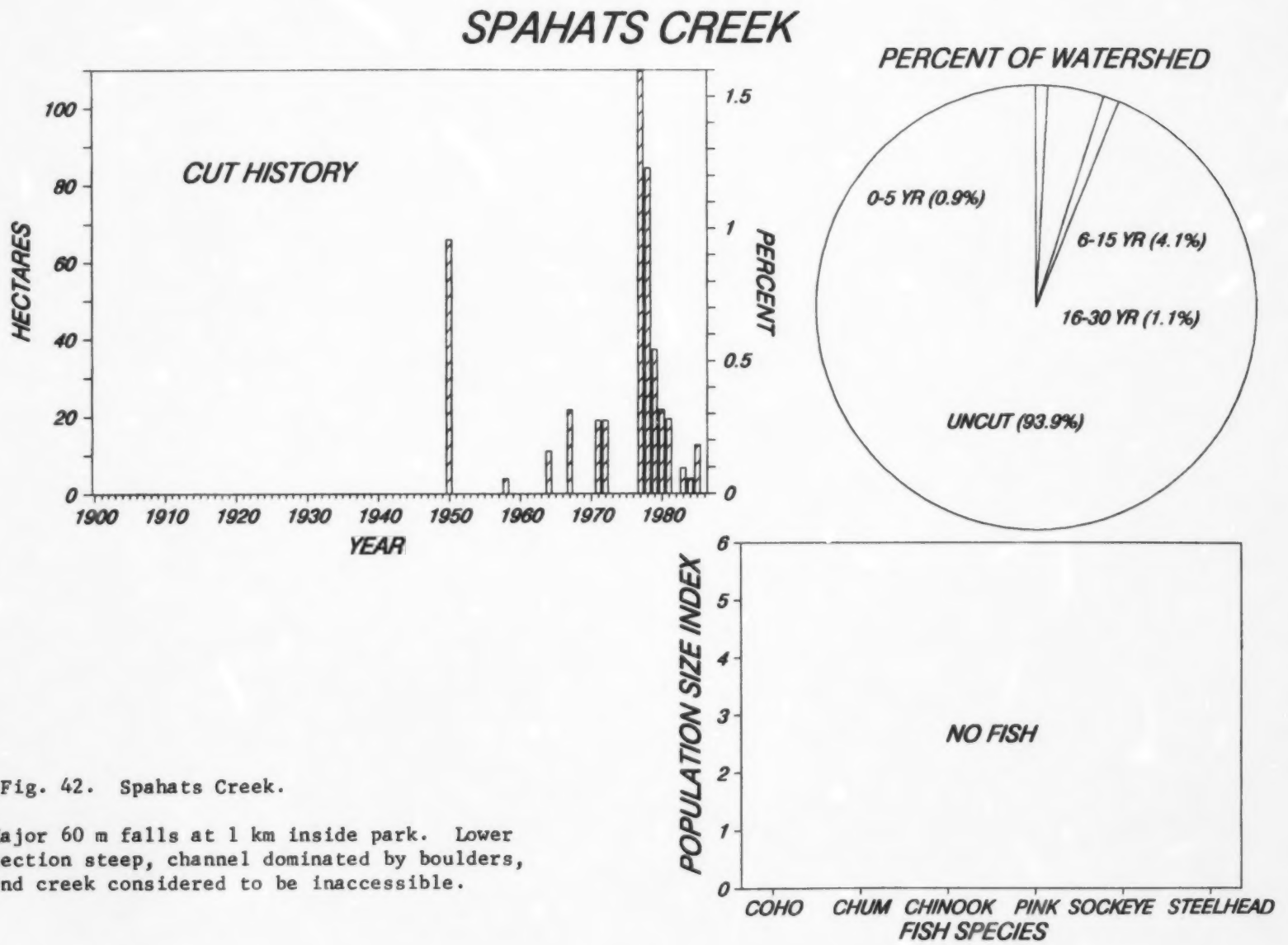


Fig. 42. Spahats Creek.

Major 60 m falls at 1 km inside park. Lower section steep, channel dominated by boulders, and creek considered to be inaccessible.

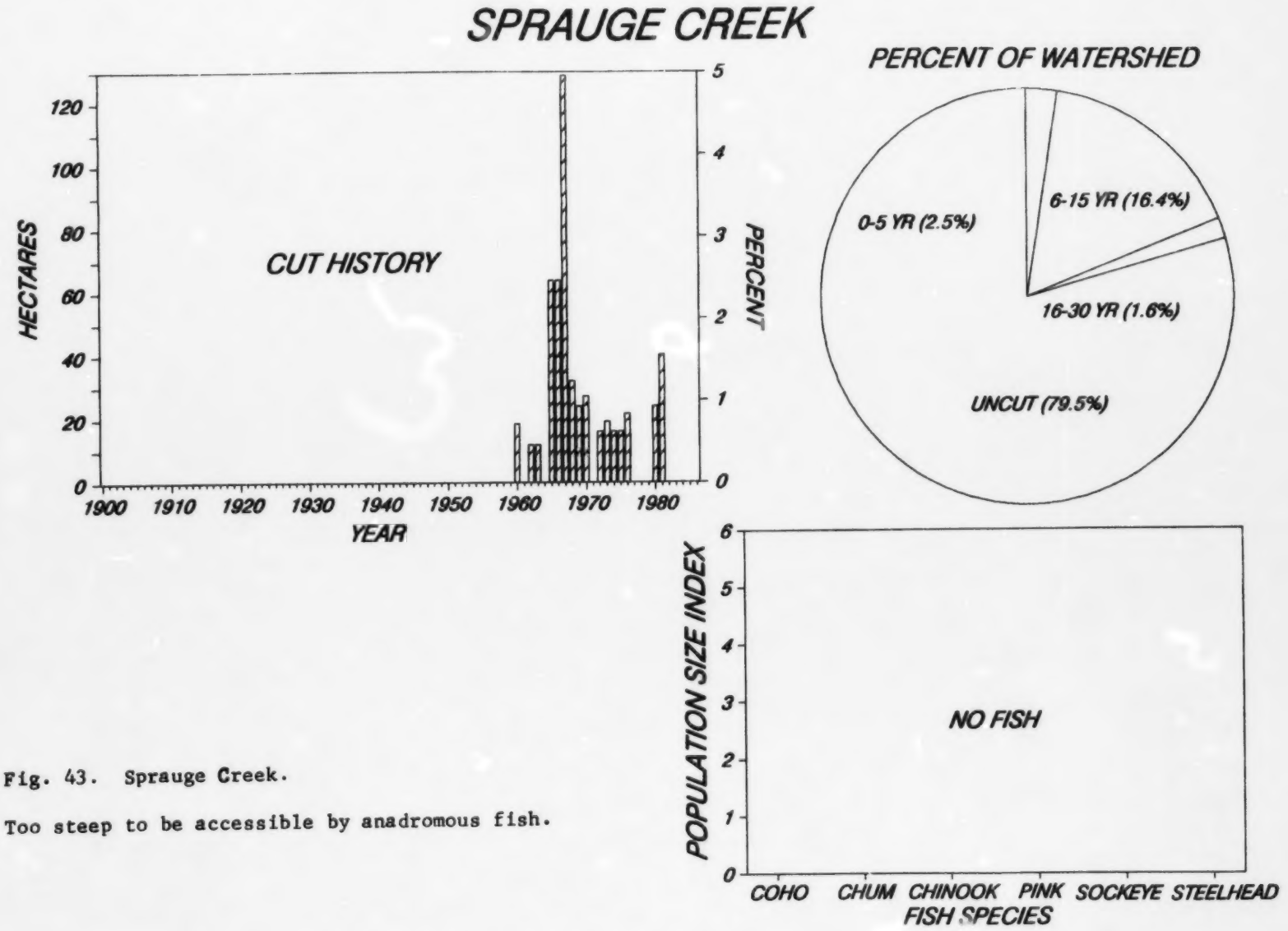


Fig. 43. Sprauge Creek.

Too steep to be accessible by anadromous fish.

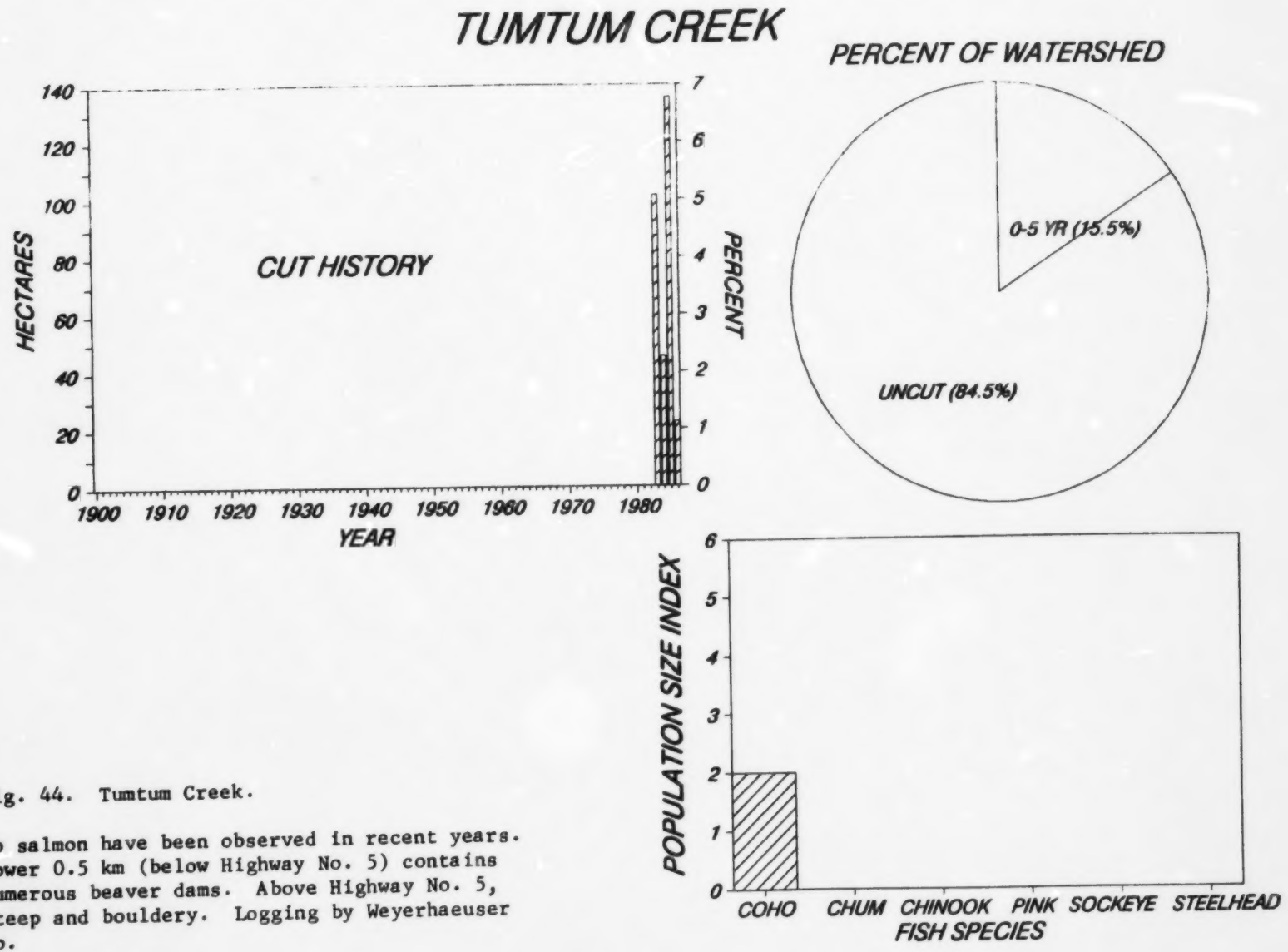


Fig. 44. Tumtum Creek.

No salmon have been observed in recent years. Lower 0.5 km (below Highway No. 5) contains numerous beaver dams. Above Highway No. 5, steep and bouldery. Logging by Weyerhaeuser Co.

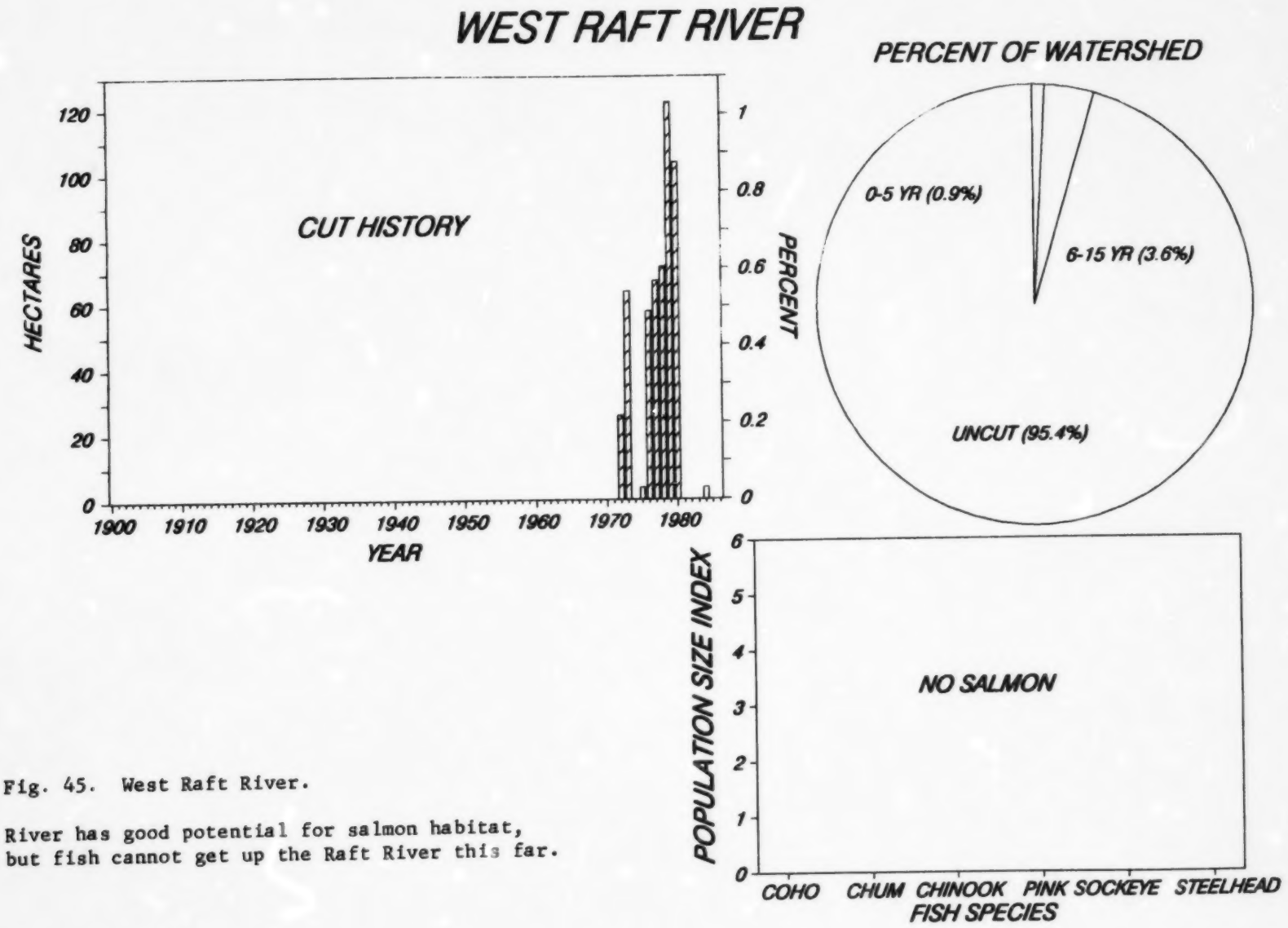


Fig. 45. West Raft River.

River has good potential for salmon habitat, but fish cannot get up the Raft River this far.

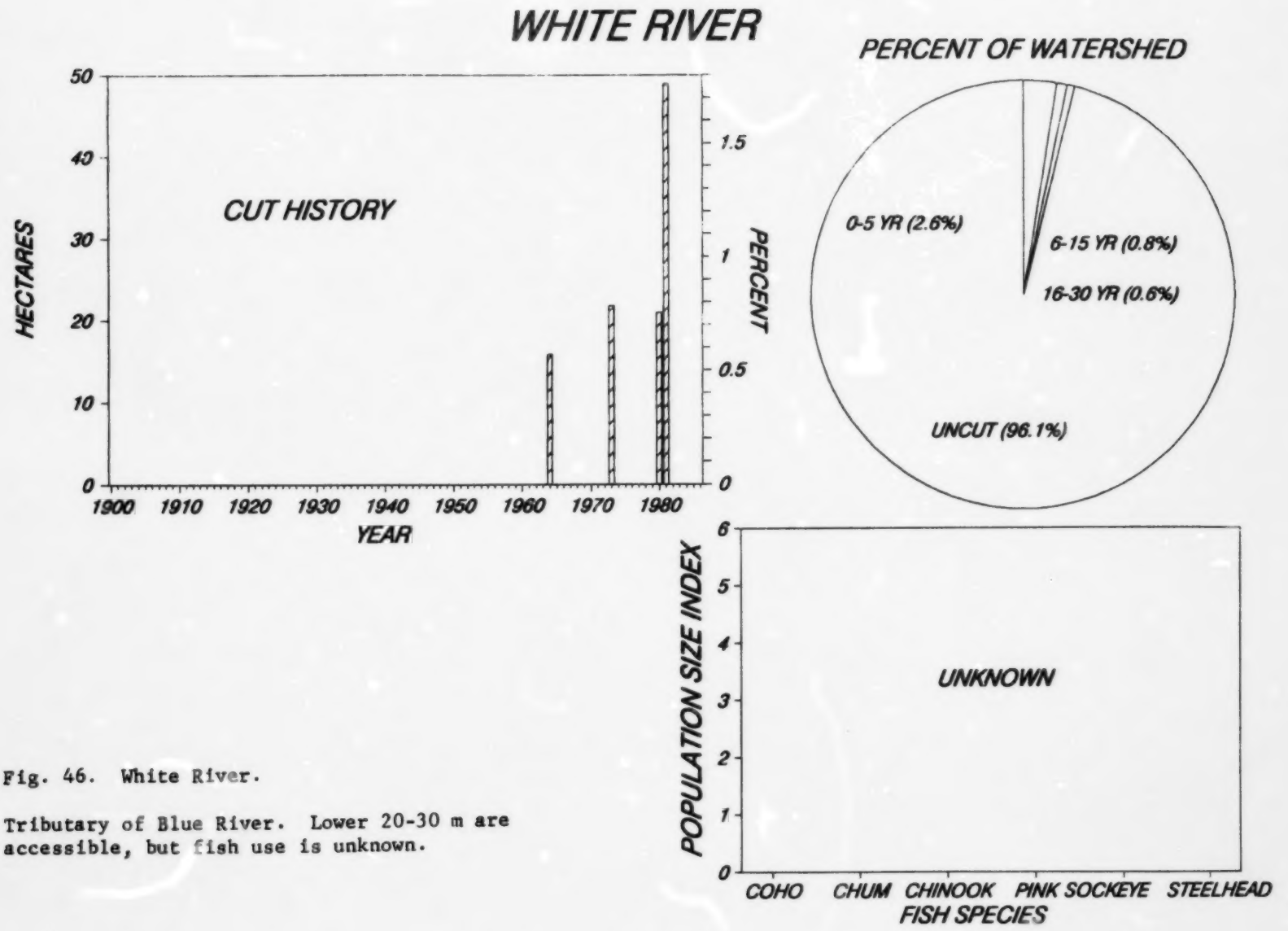
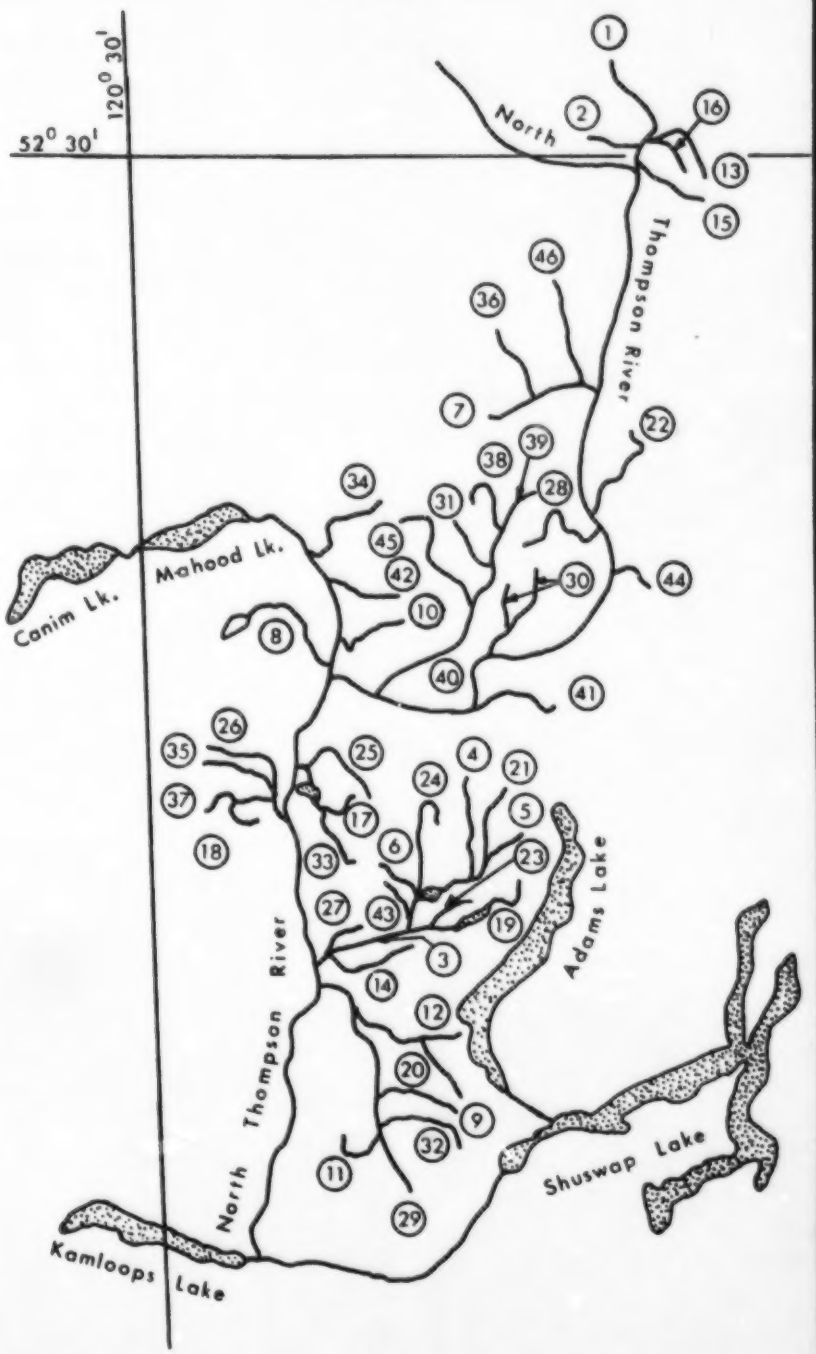


Fig. 46. White River.

Tributary of Blue River. Lower 20-30 m are accessible, but fish use is unknown.

MAP INDEX

1 ALBREDA R.
2 ALLAN CR.
3 BARRIERE R. (LOWER)
4 BARRIERE R. (UPPER)
5 BENDELIN CR.
6 BIRK CR.
7 BLUE R.
8 BROOKFIELD CR.
9 CAHILITY CR.
10 CANDLE CR.
11 CHRISTIAN CR.
12 CICERO CR.
13 CLEMINA CR.
14 DIXON CR.
15 DOMINION CR.
16 DORA CR.
17 DUNN CR.
18 EAKIN CR.
19 EAST BARRIERE R.
20 FADEAR CR.
21 FENNEL CR.
22 FINN CR.
23 HAGGARD CR.
24 HARPER CR.
25 JOSEPH CR.
26 LEMIEUX CR.
27 LEONIE CR.
28 LION CR.
29 LOUIS CR.
30 MAD R. + MARTIN CR.
31 MAXWELL CR. + TRIB
32 McGILLIVRAY CR.
33 McTAGGART CR.
34 MOUL CR.
35 NEHALLISTON CR.
36 NORTH BLUE R.
37 PHINETTA CR.
38 RAFT R. UNNAMED TRIB
39 RAFT R. (HEAD WATER-W.RAFT)
40 RAFT R. (W.RAFT-N.THOMPSON)
41 REG CHRISTIE CR.
42 SPAHATS CR.
43 SPRAUGE CR.
44 TUMTUM CR.
45 WEST RAFT R.
46 WHITE R.



0 50
KILOMETRES

APPENDIX I. NORTH THOMPSON REGION STREAMS; LOCATION AND TENURE

NO.	NAME	RIVER	LAT.	LONG.	ACCESS CODE	MAP TOPO	MAP COVER	TENURE TFL	TENURE DEED	TENURE INDIAN	TENURE TSA
1	ALBREDA R.	NORTH THOMPSON R.	52.29	119.06	3	83D/6	83D.045	0%	0%	0%	100%
2	ALLAN CR.	ALBREDA R.	52.31	119.07	3	83D/11	83D.055	0%	0%	0%	100%
3	BARRIERE R. (LOWER)	NORTH THOMPSON R.	51.10	120.08	4	92P/1	92P.020	0%	0%	1%	99%
4	BARRIERE R. (UPPER)	NORTH BARRIERE LK.	51.21	119.48	3	82M/5	82M.032	0%	0%	0%	100%
5	BENDELIN CR.	FENNEL CR.	51.24	119.35	4	82M/5	82M.043	0%	0%	0%	100%
6	BIRK CR.	BARRIERE R.	51.19	120.54	3	82M/5	82M.031	0%	0%	0%	100%
7	BLUE R.	NORTH THOMPSON R.	52.06	119.17	3	83D/3	83D.003	0%	0%	0%	100%
8	BROOKFIELD CR.	CLEARWATER R.	51.39	120.04	3	92P/9	92P.070	73%	0%	0%	27%
9	CAHILITY CR.	LOUIS CR.	50.57	120.01	4	92I/16	92I.100	0%	0%	0%	100%
10	CANDLE CR.	CLEARWATER R.	51.41	120.02	4	92P/9	92P.070	0%	0%	0%	100%
11	CHRISTIAN CR.	LOUIS CR.	50.51	119.59	3	82L/13	82L.081	0%	0%	0%	100%
12	CICERO CR.	FADEAR CR.	51.01	119.56	3	82M/4	82M.001	0%	0%	0%	100%
13	CLEMINA CR.	ALBREDA R.	52.34	119.05	3	83D/11	83D.055	0%	0%	0%	100%
14	DIXON CR.	BARRIERE R.	51.12	120.07	4	92P/1	92P.020	0%	0%	0%	100%
15	DOMINION CR.	ALBREDA R.	52.30	119.07	3	83D/11	83D.055	0%	0%	0%	100%
16	DORA CR.	ALBREDA R.	52.34	119.05	3	83D/11	83D.055	0%	0%	0%	100%
17	DUNN CR.	DUNN LK.	51.25	120.07	2	92P/8	92P.050	0%	0%	0%	100%
18	EAKIN CR.	LEMIEUX CR.	51.28	120.13	3	92P/8	92P.048	0%	0%	0%	100%
19	EAST BARRIERE R.	BARRIERE R.	51.15	119.50	4	82M/5	82M.021	0%	0%	0%	100%
20	FADEAR CR.	LOUIS CR.	51.02	119.02	3	92P/1	92P.010	0%	0%	0%	100%
21	FENNEL CR.	BARRIERE R.	51.22	119.38	4	82M/5	82M.042	0%	0%	0%	100%
22	FINN CR.	N. THOMPSON R.	51.54	119.20	4	82M/14	82M.094	0%	0%	0%	100%
23	HAGGARD CR.	EAST BARRIERE R.	51.15	119.55	4	82M/4	82M.021	0%	0%	0%	100%
24	HARPER CR.	NORTH BARRIERE LK.	51.19	119.53	3	82M/5	82M.031	0%	0%	0%	100%
25	JOSEPH CR.	NORTH THOMPSON R.	51.28	120.10	3	92P/8	92P.050	0%	0%	6%	94%
26	LEMIEUX CR.	NORTH THOMPSON R.	51.25	120.12	3	92P/8	92P.048	0%	0%	0%	100%
27	LEONIE CR.	BARRIERE R.	51.12	120.07	4	92P/1	92P.020	0%	0%	0%	100%
28	LION CR.	NORTH THOMPSON R.	51.53	119.20	4	82M/14	82M.084	0%	0%	0%	100%
29	LOUIS CR.	NORTH THOMPSON R.	51.08	120.08	3	92P/1	92P.020	0%	0%	1%	99%
30	MAD R. + MARTIN CR.	NORTH THOMPSON R.	51.45	119.30	4	82M/14	82M.073	0%	0%	0%	100%
31	MAXWELL CR. + TRIB	RAFT R. (HEAD WATER - W. RAFT)	51.50	119.42	4	82M/13	82M.082	0%	0%	0%	100%
32	McGILLIVRAY CR.	LOUIS CR.	50.52	119.58	3	82L/13	82L.081	0%	0%	0%	100%
33	McTAGGART CR.	DUNN LK.	51.25	120.07	3	92P/8	92P.050	0%	0%	0%	100%
34	MOUL CR.	CLEARWATER R.	51.50	120.03	3	92P/16	92P.090	0%	0%	0%	100%
35	NEHALLISTON CR.	LEMIEUX CR.	51.28	120.13	4	92P/8	92P.048	0%	0%	0%	100%
36	NORTH BLUE R.	BLUE R.	52.05	119.25	3	83D/3	83D.003	0%	0%	0%	100%
37	PHINETTA CR.	EAKIN CR.	51.27	120.26	3	92P/8	92P.048	0%	0%	0%	100%
38	RAFT R. UNNAMED TRIB	RAFT R. (HEAD WATER - W. RAFT)	51.55	119.35	4	82M/13	82M.093	0%	0%	0%	100%
39	RAFT R. (HEAD WATER - W. RAFT)	RAFT R. (W. RAFT - N. THOMPSON)	51.50	119.35	4	82M/13	82M.082	0%	0%	0%	100%
40	RAFT R. (W. RAFT - N. THOMPSON)	NORTH THOMPSON R.	51.40	119.55	4	82M/12	82M.061	0%	0%	0%	100%
41	REG CHRISTIE CR.	NORTH THOMPSON R.	51.37	119.38	4	82M/12	82M.052	0%	0%	0%	100%
42	SPAHATS CR.	CLEARWATER R.	51.44	120.01	3	92P/9	92P.080	0%	0%	9%	91%
43	SPRAUGE CR.	BARRIERE R.	51.17	120.56	4	82M/5	82M.021	0%	0%	0%	100%
44	TUMTUM CR.	NORTH THOMPSON R.	51.50	119.17	3	82M/14	82M.084	0%	0%	0%	100%
45	WEST RAFT R.	RAFT R. (W. RAFT - N. THOMPSON)	51.48	119.46	3	82M/13	82M.082	0%	0%	0%	100%
46	WHITE R.	BLUE R.	52.07	119.19	3	83D/3	83D.014	0%	0%	0%	100%

APPENDIX II. NORTH THOMPSON REGION STREAMS; PHYSICAL VARIABLES

NO.	NAME	ORIENT.	BIOGEOCLIMATIC VAR. PRIMARY	BIOGEOCLIMATIC VAR. SECONDARY	AREA (sq.km) DRAINAGE	AREA (sq.km) LAKE	LENGTH (km) TOTAL	LENGTH (km) ACCESS	ELEVATION GRAD	ELEVATION MAX (m)	ORDER	TRIBS
1	ALBREDA R.	N-S	ICH	ESSF	127.60	0.19	28.00			7500	6	
2	ALLAN CR.	W-E	ESSF	ICH	103.64	0.00	22.80			7000	5	
3	BARRIERE R. (LOWER)	E-W	IDF	ICH	95.32	5.28	42.00	42.00		5600	5	
4	BARRIERE R. (UPPER)	E-W	ICH	ESSF	174.30	1.58	16.50			6400	4	
5	BENDELIN CR.	E-W	ICH	ESSF	41.00	0.16	7.80	0.00		5200	4	
6	BIRK CR.	W-E	ICH	ESSF	27.82	0.06	15.80	0.00		6700	4	
7	BLUE R.	W-E	ICH	-	114.68	0.39	29.60			6900	5	
8	BROOKFIELD CR.	N-S	ESSF	ICH	76.23	1.26	21.80			5700	3	
9	CAHILTY CR.	E-W	ESSF	MS	60.71	0.08	16.00	0.00		6200	3	
10	CANDLE CR.	E-W	IDF	ICH	31.40	0.00	10.20	0.00		4700	2	
11	CHRISTIAN CR.	W-E	IDF	MS	20.81	0.00	11.60			4700	2	
12	CICERO CR.	E-W	MS	IDF	57.54	0.00	12.40	0.00		5000	4	
13	CLEMINA CR.	E-W	ICH	ESSF	73.90	0.08	18.40	0.00		7000	5	
14	DIXON CR.	E-W	IDF	MS	94.62	0.34	20.00	0.00		4900	4	
15	DOMINION CR.	E-W	ICH	ESSF	86.78	0.41	18.00	0.10		8000	5	
16	DORA CR.	E-W	ICH	ESSF	14.49	0.00	8.60	0.10		5600	3	
17	DUNN CR.	E-W	ESSF	MS	95.32	4.53	26.40			7500	4	
18	EAKIN CR.	W-E	IDF	SBS	127.24	4.92	27.00	0.00		4400	4	
19	EAST BARRIERE R.	N-S	ICH	ESSF	160.53	9.09	74.00	1.82		5500	4	3
20	FADEAR CR.	E-W	ESSF	MS	68.76	0.09	16.60	0.00		6000	4	
21	FENNEL CR.	N-S	ICH	-	47.00	0.10	20.72	7.36	10%	5600	5	3
22	FINN CR.	N-S	ICH	-	87.98	0.88	23.10	4.00		6200	4	3
23	HAGGARD CR.	E-W	ICH	ESSF	84.38	0.99	16.00	1.00		5800	3	1
24	HARPER CR.	N-S	ICH	-	221.63	0.25	27.80			7000	5	
25	JOSEPH CR.	E-W	ESSF	MS	153.58	2.12	29.40			5500	5	
26	LEMIEUX CR.	N-S	IDF	ICH	208.64	7.92	22.00			4300	5	
27	LEONIE CR.	N-S	ICH	ESSF	42.75	0.38	15.80	0.00		3600	3	
28	LION CR.	W-E	ICH	ESSF	34.19	0.61	14.50	4.36		5500	4	7
29	LOUIS CR.	S-N	IDF	MS	268.60	0.31	50.40	58.00		6800	5	
30	MAD R. - MARTIN CR.	N-S	ICH	ESSF	156.47	0.68	30.90	0.00		5700	5	1
31	MAXWELL CR. + TRIB	N-S	ICH	-	46.27	0.07	10.90	0.00		5600	4	
32	McGILLIVRAY CR.	E-W	ESSF	MS	52.55	1.04	14.40	0.00		6800	4	
33	McTAGGART CR.	S-N	ESSF	MS	24.92	0.46	11.20			2100	4	
34	MOUL CR.	E-W	ICH	-	77.12	1.05	11.20	0.00		6700	4	
35	NEHALLISTON CR.	W-E	SBS	IDF	79.59	4.43	12.60	0.00		4500	3	
36	NORTH BLUE R.	N-S	ICH	ESSF	137.87	1.83	26.40			7800	5	
37	PHINETTA CR.	N-S	SBS	-	109.53	13.56	11.00	0.00		4100	3	
38	RAFT R. UNAMED TRIB	N-S	ESSF	ICH	40.32	0.02	10.54	0.00		6100	3	
39	RAFT R. (HEAD WATER - W. RAFT)	N-S	ICH	-	190.19	2.20	35.71	0.00		6000	5	
40	RAFT R. (W. RAFT - N. THOMPSON)	E-W	ICH	IDF	168.59	0.20	33.99	4.40	1%	6300	5	1
41	REG CHRISTIE CR.	E-W	ICH	ESSF	57.56	0.13	18.90	0.50		4200	4	
42	SPAHATS CR.	E-W	ICH	ESSF	71.31	0.54	17.00	0.00		7100	4	
43	SPRAUGE CR.	W-E	ICH	IDF	26.08	0.00	8.00	0.00		5600	3	
44	TUMTUM CR.	E-W	ESSF	ICH	19.63	0.33	5.27	0.20	1%	5200	4	1
45	WEST RAFT R.	N-S	ICH	ESSF	113.23	0.00	18.18	0.00		6200	4	
46	WHITE R.	N-S	ICH	ESSF	27.19	0.02	12.80	0.03		7500	4	

APPENDIX III. INDEX OF FOREST CUT HISTORIES AND SALMONID ESCAPMENTS

NO.	NAME	NO.	NAME
1	ALBREDA R.	24	HARPER CR.
2	ALLAN CR.	25	JOSEPH CR.
3	BARRIERE R. (LOWER)	26	LEMIEUX CR.
4	BARRIERE R. (UPPER)	27	LEONIE CR.
5	BENDELIN CR.	28	LION CR.
6	BIRK CR.	29	LOUIS CR.
7	BLUE R.	30	MAD R. + MARTIN CR.
8	BROOKFIELD CR.	31	MAXWELL CR. + TRIB
9	CAHILITY CR.	32	McGILLIVRAY CR.
10	CANDLE CR.	33	McTAGGART CR.
11	CHRISTIAN CR.	34	MOUL CR.
12	CICERO CR.	35	NEHALLISTON CR.
13	CLEMINA CR.	36	NORTH BLUE R.
14	DIXON CR.	37	PHINETTA CR.
15	DOMINION CR.	38	RAFT R. (UNNAMED TRIBUTARY)
16	DORA CR.	39	RAFT R. (HEAD WATER - W.RAFT)
17	DUNN CR.	40	RAFT R. (W.RAFT - N.THOMPSON)
18	EAKIN CR.	41	REG CHRISTIE CR.
19	EAST BARRIERE R.	42	SPAHATS CR.
20	FADEAR CR.	43	SPRAUGE CR.
21	FENNEL CR.	44	TUMTUM CR.
22	FINN CR.	45	WEST RAFT R.
23	HAGGARD CR.	46	WHITE R.